SOUTHERN

Flight

Including MODERN AIRPORTS

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August, 1945

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SIKORSKY HELICOPTERS SERVE THE B-29's

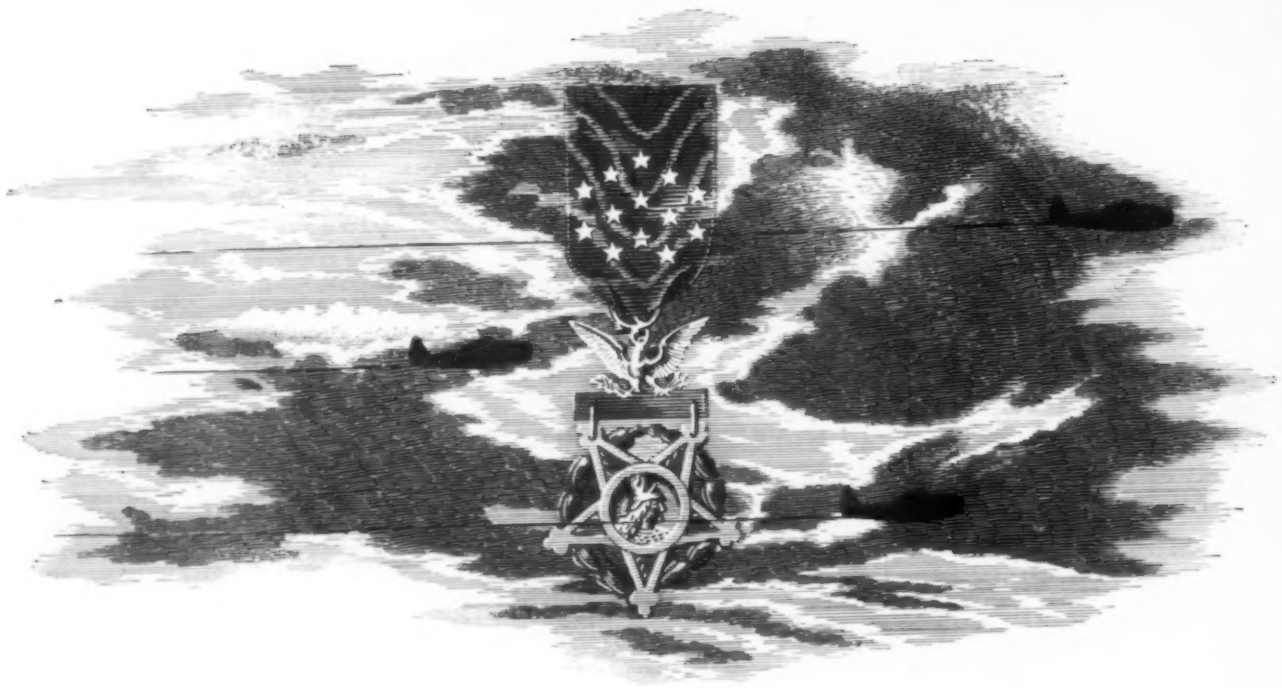
Far out in the Pacific, R-4 Sikorsky helicopters operate a ship-to-shore shuttle service from floating Army repair bases. They bring up-to-the-minute maintenance service to the Superforts based on newly-won air strips.

SIKORSKY * AIRCRAFT

BRIDGEPORT, CONNECTICUT

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

AUG 24 1945.



Above All

"Over and above the call of duty"... begins the citation of a coveted but never calculated award, for with that simple acceptance of the moment's need, so aptly phrased in the inimitable slang of one immortal Ace, many a pilot "has seen his duty and done it." ☆ ☆

So, too, must the plane measure up in performance and ruggedness to necessity's exacting demands, and we are proud to stress that American planes of all makes and types have delivered a magnificent performance to the honor and glory of the Air Corps.

It is, however, our gratifying privilege to point to records set by the Thunderbolt on all fighting fronts which not alone demonstrate its versatility, but "over and above the call of duty" stress it s well merited reputation for "bringing them back alive."

REPUBLIC AVIATION
CORPORATION

Farmingdale, L. I., N.Y. — *Makers of the Mighty Thunderbolt* — *Evansville, Ind.*

Rugged Addition to a *Flying Family*

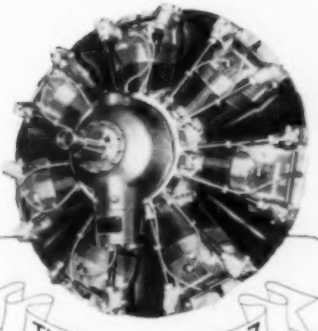
Like the heredity of generations passed on to new life in the wilds, three models of Cyclones with over *one hundred million* hours of operation form the background of the newest engine in the Wright series: the Cyclone 7.

This engine, rated initially at 700 horsepower, combines the best features evolved in 20 years of Cyclone experience. It was designed specifically for short-range military aircraft—trainers, cargo carriers and transports—and for feeder lines and utility planes.

The Cyclone 7 features economy. It is rugged, reliable, powerful. It saves fuel costs by using low octane fuel. It saves parts inventories by interchangeability with other Cyclones. It cuts overhaul and maintenance costs by long service life. Combining durable power with operating economy, the Cyclone 7 is an engine which will make possible a new type of air transportation.

WRIGHT
AIRCRAFT ENGINES
DIVISION OF
CURTISS WRIGHT
FIRST IN FLIGHT

Wright Aeronautical Corporation • Paterson, New Jersey, U. S. A.



The New CYCLONE 7

A seven-cylinder engine combining Cyclone features proved in service. Distinctive points include:

700 HP to 7500 feet
91 Octane Gasoline
Dynamic Suspension
Exceptional Cooling
Two-speed Supercharger
Cyclone Interchangeability
Cyclone Overhaul Equipment
Forged Cylinder Heads
Aluminum Finned Barrels

Revving Up

HISTORICAL DAYS: This column is the last to be written and printed as we go to press every month, and usually contains last-minute developments too late for our news section. This month we've been swamped, at the last minute, by one of the most outstanding events in history.

Atomic bombing became a reality as we went to press. Full details were not available, but history will long remember Hiroshima as the world's first city to crumble beneath atomic bombing. It was on this Japanese town that the 20th Air Force dropped the first atomic bomb—a relatively small missile of about 400 pounds total weight which derived an explosive force equal to 20,000 tons—tons, not pounds—of TNT, from a secret process of atom-splitting. For years Sunday supplement writers have pictured the atomic bomb as the ultimate in weapons. The key to success with U. S. atomic energy experiments was in the release of forces within the structure of uranium, a heavy, lead-like metal derived from pitchblend. A test explosion in New Mexico on July 16 vaporized a steel tower on which the test bomb was detonated from the ground, shook windows at incredible distances and knocked down observers six miles away. The first bomb dropped on Japan probably was detonated in mid-air just above the target. When the full extent of its destruction becomes known, atomic bombing will probably force a revision in air war tactics and equipment. It will also furnish an answer to the skeptics who have doubted air power's ability to win wars.

★ ★ ★

TPFA ROUNDUP: Roy Arledge of Stamford was elected president of the Texas Private Fliers Association at its annual meeting last month in Abilene, succeeding Les Stringer of Wichita Falls. Others elected are Jimmie Kolp of Electra, first vice president; Lee Meyer of Houston, second vice president; Mrs. Pearl Ragsdale of Austin, treasurer, and W. B. Matthews of San Antonio, secretary. Two-year-term governors added to the board are R. P. Smith, Port Arthur; M. L. Bird, Abilene; W. Vernon Walsh, Harlingen; Roy Box, Corpus Christi; H. W. Shirley, Childress; Roy Taylor, Fort Worth; Sam Vanderweide, San Antonio; Robert Ragsdale, Austin; George Jalonick, III, Dallas; Elmo Penn, Kilgore.

★ ★ ★

PROGRESS REPORT: A piece of string is one of the most important "instruments" on the jet-propelled P-80 (see page thirty-two for photos, data). A piece of string was also one of the most important "instruments" on the pioneering Wright biplane. Whereas the Wright brothers utilized a dangling string to indicate turn and bank, P-80 pilots use theirs to indicate yaw. It is plain red yarn, tacked by one end onto the nose cowling. . . . We asked Test Pilot George McEntire to express the 80's speed in a non-technical way, and he

(Continued on page 24)

SOUTHERN Flight

Including MODERN AIRPORTS

Twelfth Year of Progress With Aviation

AUGUST, 1945 VOL. XXIV, NO. 2

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Launching Invasions from Sea-Going Runways

As the invasion of the Pacific islands draws closer and closer to Japan itself, our Naval Carrier Force plays a more and more important role. From these mobile bases, planes range deep into enemy territory to unleash their cargoes of destruction.

The power behind these bombs is toluene, first made synthetically at Humble's Baytown Ordnance Works. Since Pearl Harbor this plant has produced the toluene for *one out of every two* United Nations' bombs. At the same time another Humble plant has furnished Allied Air Forces with a billion and a quarter gallons of 100-octane aviation gasoline.

Wartime research has widened our horizons and accelerated the pace of our progress. When planes once more fly only on missions of business and pleasure, you'll find that Humble Esso Aviation Products are not only *abreast* but well *ahead* of aviation progress.

HUMBLE OIL & REFINING CO.

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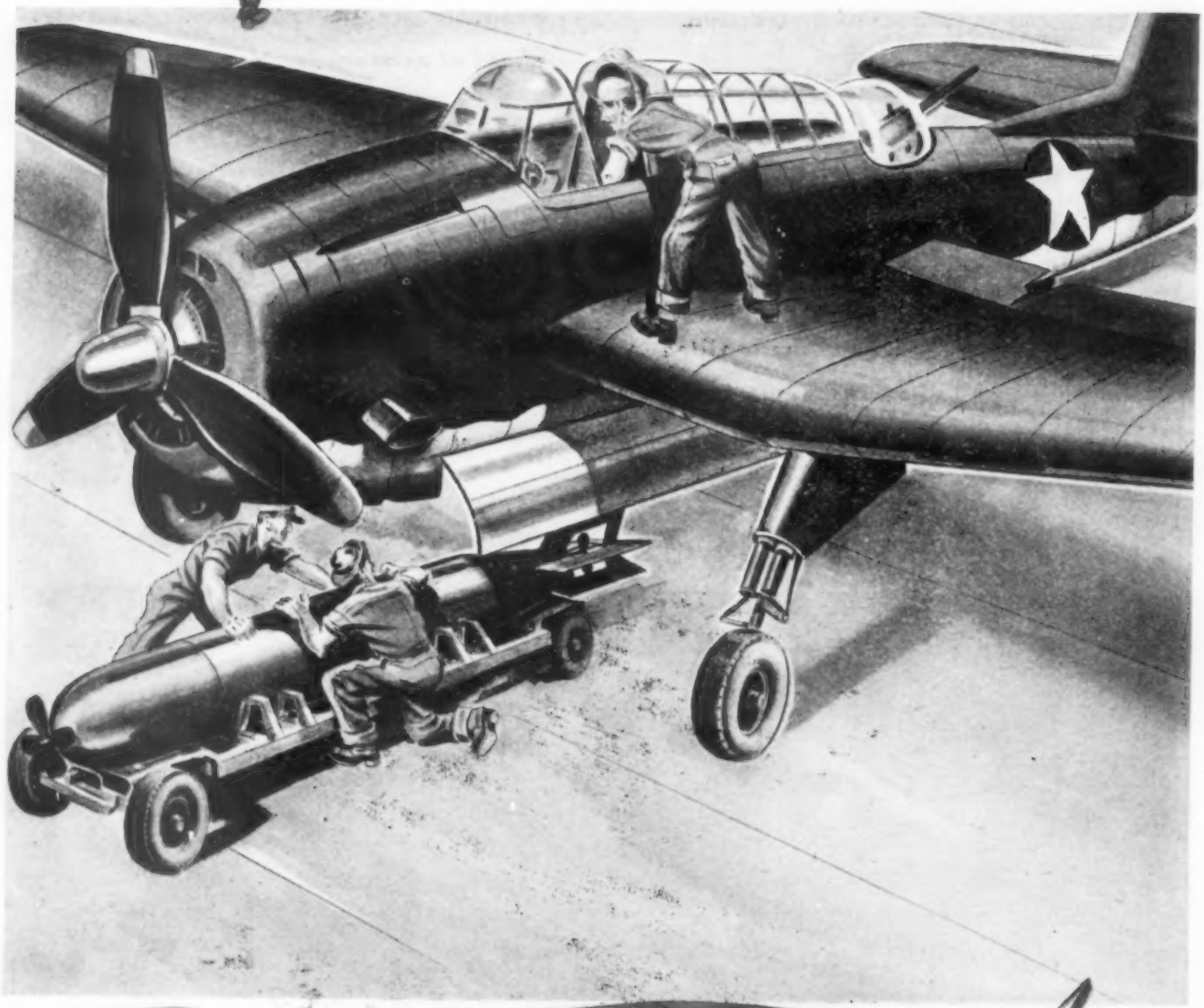
Humble-Esso Aviation Products

Today Humble-Esso Aviation Products serve the vital demands of war; tomorrow they will serve equally well the needs of peace.

Call to Continued Service

Until the last mission is flown . . . until complete Victory is ours . . . SOUTHERN heeds the call to serve our armed forces with torpedo bay doors for the Avenger, wing sections and tail groups for the Hellcat and the new Grumman Tigercat. Post-war, the call for industrial and civilian aeronautical needs will be answered with the same dependability by . . .



ARMY (E) NAVY

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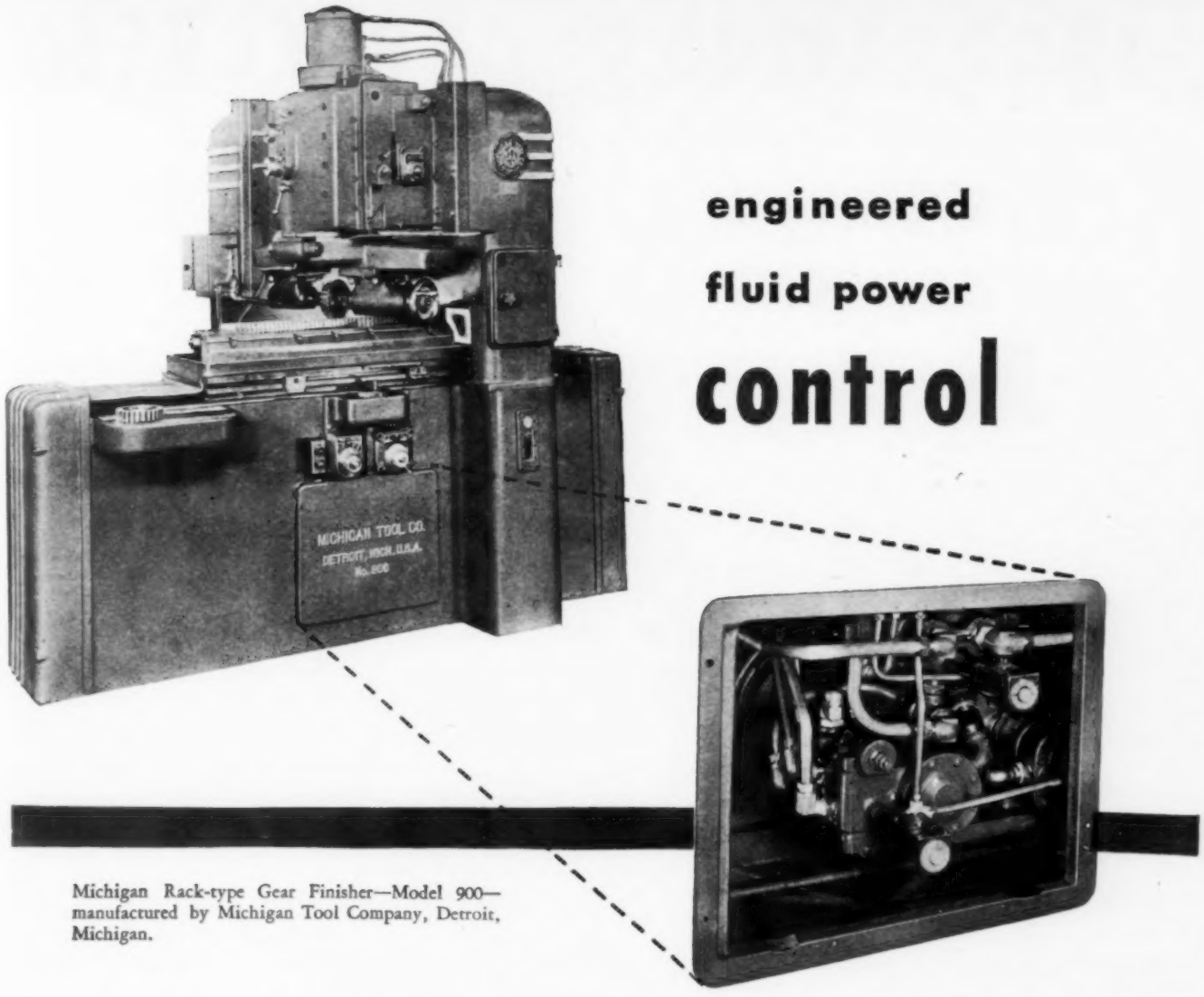
AIRCRAFT CORPORATION

PLANT IN GARLAND, DALLAS COUNTY, TEXAS



Michigan Rack-type Gear Finisher—Model 900—manufactured by Michigan Tool Company, Detroit, Michigan.

engineered fluid power control

The hydraulic controls which make this machine—and millions of others perform with such reliability—call for tubing systems based on the principles of Fluid Power Engineering.

When properly engineered and built, these systems have certain "must" features—

1. They streamline the flow of fluids. This permits adequate response to control with minimum system capacity.
2. They make minimum demands on the power source—an economy feature.
3. They fit into the available space, even when space is limited and cramped.
4. They are planned for easy accessibility to all parts—for service and maintenance.
5. They have the smallest number of joints and connections—all leakproof—even under high pressure, vibration or abuse.

FLUID POWER engineered systems—with Parker valves, fittings and fabricated tubing meet these requirements. They are backed by more than twenty years of "know-how".

If you plan to use Fluid Power—if you need tubing installations for any purpose—ask a Parker engineer for recommendations. The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio. Booklet on request.

THE

PARKER

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FLUID POWER ENGINEERING

JUST AMONG OURSELVES

Editorials and Comment

MAKE WAY FOR THE JUNKIES

THE loss of Edward L. Traylor from the RFC surplus war aircraft division is likely to be a costly one. His unexpected resignation in July as assistant director probably stems from intramural strife within the RFC rather than from the flood of criticism emanating from the outside. We imagine he was simply fed up with the parasite drag and constant interference from officials in his own agency, which is largely composed of "experts" from the pot and pan field, the dungaree manufacturing industry, the automobile industry, the purchasing agent field and other non-aviation lines of endeavor. Traylor was the only man in a relatively high administrative post whose aviation background adequately equipped him for administering surplus sales.

His job was as difficult and as thankless as any job in Washington. With nearly a year of surplus handling experience behind him, he was gradually bringing about common sense policies into his division. We admired him for his aggressive and honest efforts to get a fair market price for the government and yet establish sales policies that would help and not hurt the aviation industry. That's a tough assignment for anybody. He made some mistakes, but he never made the same mistake twice.

Traylor was one executive you could talk to in Washington and soon discover he knew what he was talking about. This is a rare experience in the capital. He took every telephone call and saw everyone who came into his office. Unafraid of carping critics, he was always open to constructive suggestions and worked diligently trying to straighten out the many kinks and complex problems of warplane surpluses. His long suffering patience and his ability to pound through progressive measures so that the airplane-hungry market could absorb the best planes at a fair price with a minimum of red tape paid dividends all around.

Other than a small handful of technically trained aviation men, none of whom held administrative jobs, Traylor alone was close to civil aviation's basic problems as regards surplus aircraft disposal. He recognized the danger of permitting surplus disposal policies to be created and directed by individuals ignorant of or apathetic toward these basic problems. Whether his resignation was forced or voluntary doesn't matter. The fact that the topside bureaucrats, who know little and care less about the implications of surplus disposal on the overall future of aviation, are still in the saddle is reprehensible. Chances are that the other airmen in the division also will resign, leaving the department in the hands of incompetents.

The one hope left — expressed in these columns two months ago—is that the quicker our manufacturers of civilian aircraft can get into production the quicker the surplus problem will solve itself, unless, of course, the junk dealers are permitted to take over and provide even more chaotic conditions than now exist. When men of the ability and calibre of Ed Traylor move out, the way is automatically paved for the junkies to move in.

☆ ☆ ☆

AN UNFORTUNATE SQUABBLE

DEFERMENT of action on Federal-aid airport legislation until late fall of 1945 is now sure. This means that any construction under whatever airport program may finally emerge is out of the question until mid-summer of 1946, or even later.

Delay of this sort is most disappointing, particularly since it is to a certain degree due to an unfortunate squabble that developed during the latter stages of the hearings on the proposed bills; when it became apparent that state agencies and municipalities could not agree among themselves on the extent of control each should have over the spending of any funds that might be forthcoming as a result of the legislation proposed.

The United States Conference of Mayors, represented among others by Mayors La Guardia of New York and Kelley of Chicago, definitely wanted to by-pass the state authorities and deal directly with the Federal government in connection with airport projects. "Chaos would result," said Mayor La Guardia, if any other method were followed. The contention of the mayors was based on the fact that airport development had so far been largely a municipal rather than a state matter and that municipalities had received very little, if any, encouragement from state officials in the past.

The state officials, as represented by the Governors' Conference and the National Association of State Aviation Officials, held that the entire airport aid program should be administered at the state, rather than the local, level. They contended that only in this manner could airports be built in accord with the needs of the state, the local communities and the nation. It was suggested that provision for local communities dealing directly with the Federal government could be provided in cases where a state failed to exercise its opportunities to participate under any Federal-aid program. Of course the governors and other state officials were following well-tried paths in these recommendations as they adhere to the scheme followed for years by the Federal-aid highway program.

The municipalities were upheld in their contentions by the airlines, which are naturally interested in adherence to the traditional practice in airport development based on co-operation between the Federal government and local sponsors, rather than co-operation at the state level.

Because of these differences in opinion the House and Senate Committees both spent a great deal of time in reconciling the governors and the mayors instead of deciding the major question of whether Federal aid should be granted at all and, if so, to what type of airports and where.

Certainly the mayors were on firm ground in their contention that, so far, airport building in this country has been, with very few exceptions, wholly a municipal activity. But there is the danger that unless a state agency has the general oversight of the airport-aid funds, the larger cities will obtain the greater share and the smaller towns, so far unable to finance airports of any sort, will be left out in the cold. Right now more air-

worth waiting for NEWS

No. 6 "Safety, Simplicity, Speed" THE SIXTH OF A SERIES OF INFORMATIVE ADVERTISEMENTS ABOUT THE NEW CULVER. PUBLISHED BY THE CULVER AIRCRAFT CORPORATION, WICHITA 1, KANSAS

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DO YOU THINK FLYING IS *Safe?*

IN A RECENT release of figures from insurance records we noted with interest that travel by automobile is ten times as safe as travel by personal plane.

Being in the aviation industry and looking to the future of private flying, these statistics were thought-provoking. It's true, according to Civil Aeronautics Authority of the U. S. Commerce Department that more than 70% of private plane accidents are charged to pilot error. Such figures provide aircraft manufacturers with a ready-made reason for this high percentage of accidents. But, if aviation is to grow and assume the proportions of utility in American life that we dream about and hope for, aircraft designers and manufacturers must realistically approach these facts and ask themselves: *"Why do we design and build ships that give so much opportunity for pilot error?"*

In other words, if private flying is to reach great proportions, it must be Safe and Simple. The chance for pilot error must be eliminated, to a great degree, from the cockpit. The plane must do much of its own thinking to eliminate poor and inexperienced judgment on the part of the pilot. The operation of the airplane must come natural – yes, just as natural as driving a car.

Coordination, which is the word that rings so loudly in the ears of "washed-out" pilots in the Army and the Navy, must be accomplished largely by the airplane itself. The technical aspect of piloting, such as knowing degrees of turn and angles of climb and descent, cannot entirely be left to the novice pilot who may have an improper conception of such angles and degrees; not to mention the hazards of flying a strange airplane with its own peculiar flying characteristics. The airplane, as we see it, must answer almost by itself these technical questions while being flown.

We at Culver believe: *Flying must be Safe and Simple!* And we have dedicated ourselves to designing and building an airplane that will be Simple to control and provide the highest possible degree of Safety. We want everyone, regardless of age and capabilities, to be able to fly and fly safely. We want to see the airplane come into its own by way of utility; not just for hobby flyers, or hot thrill-seeking pilots, but a means of transportation for the masses. In other words, we want the insurance figures to reveal that flying is as safe, if not *safer,* than driving a car.

And in addition we want to add a third "S" to those of "Safety and Simplicity," and stress "Speed." For in our postwar ship we have sacrificed none of the recognized speed of Culver in trying to accomplish the perfection of simplified control which means safety and simplicity of operation.

So in your new Culver, expect to find the three "S's" of aviation:

"SAFETY," "SIMPLICITY," "SPEED"

You can expect Culver to offer this Safety, Simplicity, and Speed on the same economical basis of operation that has always characterized Culver: *maximum performance on minimum horsepower.*

If your thinking matches ours, you'll be waiting for that new low-winged, plastic bonded wood constructed monoplane with the electric tricycle retractable gear . . . we know you'll find it definitely *worth waiting for!*

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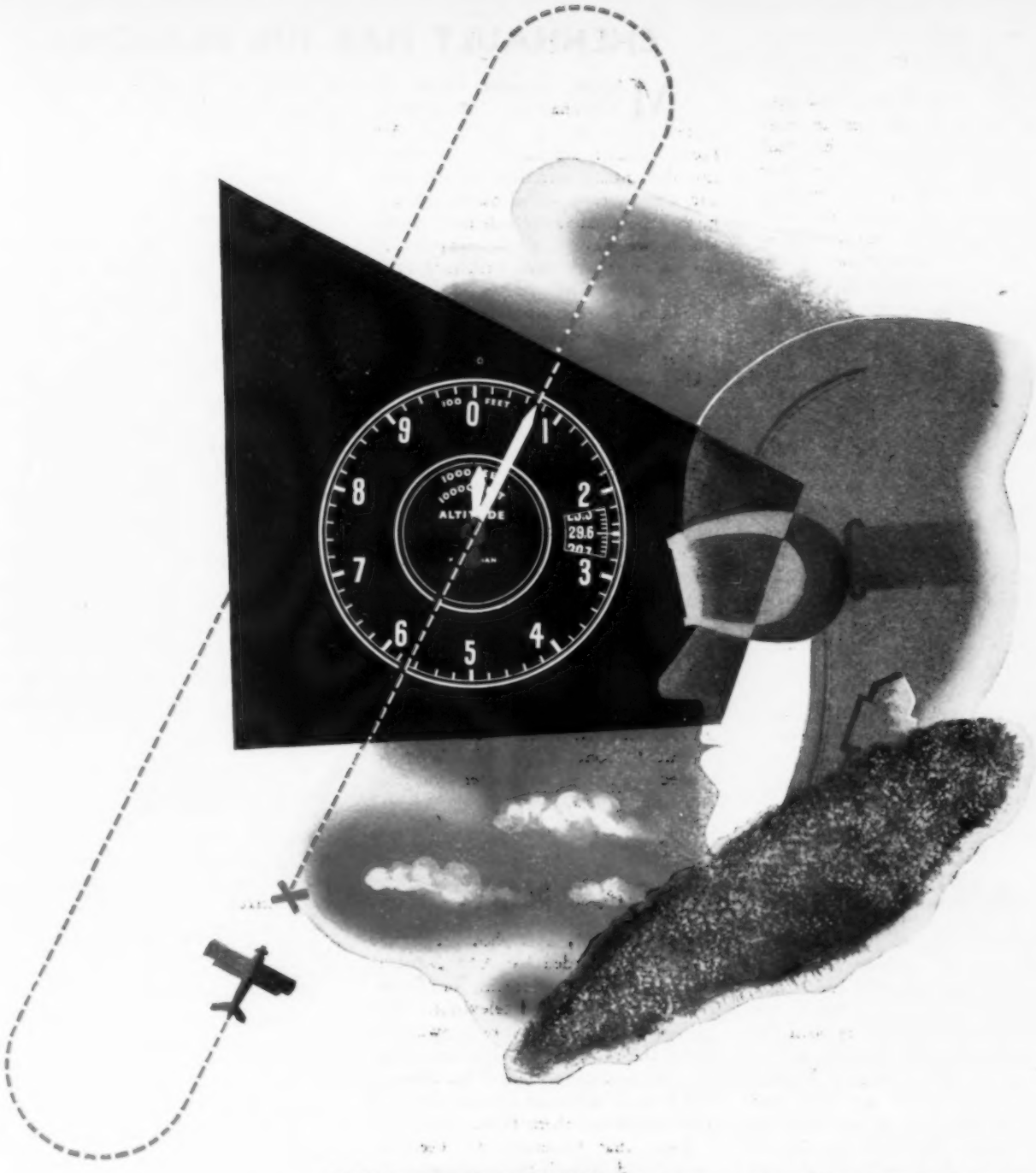
International flight fosters international friendships. As air service expands there will develop closer relationships, and better understanding among people and nations.

Coordinated air service, such as planned by Braniff Airways between the Americas, will weld together in good will the people of the Western Hemisphere. Increased trade with all its benefits will surely follow.

BRANIFF AIRWAYS



FROM THE FIRST BLIND FLIGHT in history when "Jimmy" Doolittle took off, made a circuit and returned to his starting point by reference to instruments alone, Kollsman Instruments have played a vital part in almost all history-making flights. Just as the development of the first Sensitive Altimeter made possible that first blind flight, other products of Kollsman's continuing research and development in the field of aircraft instruments have played similarly important roles in aviation history.

KOLLSMAN AIRCRAFT INSTRUMENTS

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ELMHURST, NEW YORK · GLENDALE, CALIFORNIA

ports at more places are needed even more than improvements on the big city airports.

Most of the 1,600 airports now open to civilian flying are adjacent to cities of 10,000 and over but less than half of the nation's population is in these cities. The big need for development is for localities of much less than 10,000 population and hardly one in five of the 2,387 communities in this country, with a population of 2,500 to 10,000 population, has an airport today. This is one reason why state officials are concerned in the matter.

The Lea measure settles the controversy — city vs. state — in favor of the cities by permitting cities and municipalities as well as states, to apply directly to the Federal government for airport construction funds. The McCarran bill decides the controversy by allocating 65 per cent of Federal expenditures to state governments and 35 per cent to city governments.

It looks now as if the municipalities, on the basis of the record, will be the dominant influence in determining the final form of the apportionment administration provisions of any bill that may be adopted, whether Lea's or McCarran's. State governments and state aviation agencies have so far waged an up-hill fight in their attempt to get a portion of the funds allocated at the state administrative level. The chief weapon used by the cities has been their ability to show, on a dollar and cents basis, what they have already spent in airport development. Relatively few states are able to show any considerable degree of financial participation in the construction of airports.

The unfortunate controversy is far from settled. In the next set of hearings on Federal-aid programs let the mayors and the state officials put up a united front if possible. What is needed is airports, no matter who handles the money.

CHENNAULT HAS HIS REASONS

MAJOR General Claire L. Chennault's resignation from command of the 14th Air Force focuses attention on a situation demanding complete investigation and explanation. The public should know more about conditions under which we have lost the services of one of aviation's most brilliant tacticians.

General Chennault didn't make his decision without serious reason. The matter strongly suggests fumbling of a kind which has plagued the development of air power in the past and which can jeopardize its future. Although airmen have suffered most from the ignorance and scheming of outsiders, they must guard against blind and selfish cliques and favoritism within their own ranks.

It is no secret that Chennault has been the victim of disfavor in high AAF places. Otherwise his repeated requests for equipment and supplies and other considerations would have resulted in satisfaction instead of despair. Those who know him cannot believe Chennault received all the consideration he was entitled to. There is good reason for such feeling. He despaired of Air Corps handling once before — and proved his contentions. That was when Chennault volunteered his services to China after retiring from the Air Corps. His record of organizing and leading the American Volunteers Group to brilliant victories over superior Japanese forces, using tactics the Air Corps had previously refused to accept, proved his ability and competence. More important it proved the incompetence of those who forced his untimely retirement. It was more than ill health that caused Chennault to retire from active duty then. The truth is that Chennault couldn't stomach the inefficiencies and petty scheming which plagued the Air Corps during the 30's. Now that he has retired again, it is more important than ever that the reasons behind his despair be determined.

The fortunate fact that we are winning the war against Japan without Chennault should not cloud the issue. In the next war we will need all the resourcefulness available. The lesson from Chennault's experiences with the Air Corps is a vital one. Air generalship has been tampered with, handicapped and penalized by improper handling. Chennault's record speaks for itself. It will require a lot of explanation to justify the treatment he received from those responsible for his resignation.

☆ ☆ ☆

AIRLINES NEED RADAR NOW

BECAUSE of security, not much has been permitted to be publicly known about radar. But enough has been said to offer a reasonable understanding of the possibilities in the latest radio miracle. It has been used to guide bombers through heavy fog and clouds to vital war targets. Airmen have spotted and destroyed enemy submarines invisible to the naked eye. With radar naval gunners have bracketed enemy targets far beyond the horizon and in impenetrable weather. By locating German planes long before they reached the cliffs of Dover, and thus enabling the RAF to obtain the greatest possible utilization of its pitifully-weak fighter squadrons during the Luftwaffe's seige of England back in 1940, radar has been credited with saving England from defeat.

Perhaps some day soon the powers that be will tell more about such an incredible accomplishment. Meanwhile, we have seen photos showing how radar penetrated solid cloud cover to enable our bombers to spot and destroy German defense installations along Normandy's beaches on D-Day. Registered as plainly as a photograph, the scene was recorded for AAF bombers on radar viewing screens, or scopes. By a sort of reflected television, radar provided a vivid picture showing in detail the coastline, the invasion boats, the Normandy defense installations and French cities and towns—although solid cloud hid them from view.

Now that Germany has been defeated, and Japan is being systematically rendered impotent to resist destruction, steps should be taken to utilize the miracle of radar in commercial air operations. Eventually it will be available to private flying; the Civil Aeronautics Administration has begun exhaustive studies of its possibilities. But there is an immediate and pressing need right now of radar operations in airline operations. It requires little imagination to realize the immeasurable benefits to airline operations which can be accomplished through radar. If fighters and bombers can operate in zero zero weather to locate and destroy the enemy, then commercial airplanes can develop round-the-clock dependability.

Surely the reduced needs of the one-front war have made it possible for the military services to allocate experimental radar sets to the airlines and the CAA. Everything possible should be done to expedite adaptation of radar to civilian aviation. The uncanny viewing scopes which pictured Normandy's beaches for 8th Air Force bombers can be used to locate airport runways for all-weather air commerce and to warn against fog-hidden obstacles to save lives and property.

U. S. Navy's Latest Jolt for Japs—The Grumman Tigercat

Out of a dozen years of experience in building carrier based fighters, and the applied lessons of current combat, has come the Navy's newest fighting airplane—the Grumman Tigercat. In the skilled hands of Marine pilots the new F-7-F will write new pages in the log of carrier warfare.

Grumman

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Over 700 miles per hour!

CURTISS WIND TUNNEL SPEEDS DESIGN PROGRESS

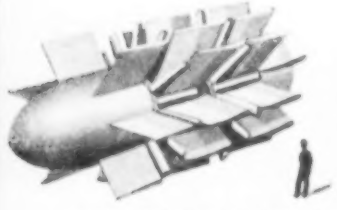
1 Into the 8½ x 12 foot test chamber goes a 10 foot span model. Sealed off from the balance of the tunnel, models may be changed or worked on in the chamber without affecting the test pressure of the tunnel itself.

THE aerodynamicist deals in the shape of things to fly. His workshop is a wind tunnel. His aim, to determine the behavior of full-size aircraft under all conditions before they are ever built or flown.

For him Curtiss-Wright constructed within its Buffalo Research Laboratory the largest, costliest variable density wind tunnel ever owned by a single aircraft corporation.

By compression or evacuation the air in the tunnel may be varied from 4 to 60 pounds per square inch to enable tests formerly requiring three or four tunnels.

Here, with no risk in human life and with tremendous savings in the time and money involved in building and test flying full-size aeroplanes, Curtiss-Wright speeds the development of aviation that all the world may more quickly and fully share its benefits and bounties.



2 Twin 16 blade, 22 foot diameter fans driven by a 14,000 horsepower motor capable of whipping 210,000 cubic feet of air through the tunnel test chamber at speeds approaching the velocity of sound.

All wind tunnel operations are controlled from this Console. The reactions of the model under test such as Lift, Drag, Pitch, Roll, Yaw, Crosswind and Load Pressure are recorded on dials automatically fed into special IBM tabulating machines. Within 20 minutes these mechanical marvels compute and deliver a mathematical picture of test results that would otherwise consume weeks of laborious human calculations.

3 Giant vanes at the corners of the wind tunnel direct the air around the turns, prevent it from "piling up" at the sides. Here, also, coolers take the heat from the air built up by the tremendous friction of many times tornado speed.

CURTISS AIRPLANES
DIVISION OF
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FIRST IN FLIGHT

The Piper Cub Skycycle — single place, 40 hp., 115 mph., private plane.

Looking Ahead with Lear

Piper Cubs were outstanding private planes long before the war. As "grasshopper" Army liaison planes they have won all kinds of acclaim on the front lines.

So it's a sure bet that post-war Cubs will bristle with new features developed from a wide successful background.

Speaking from experience, Piper has this to say about Lear Radios:

"Well remembering the part Lear Radio has played in the development of low-priced equipment for personal planes, we are looking forward with a great deal of interest to the many improvements they will have to offer after the war."

(Signed)
W. B. St. John, Sales Manager
Piper Aircraft Corporation

Lear has built high-efficiency, small, light aircraft radios since 1930. They have been standard equipment on many of the most popular types of private planes and commercial airliners. Constantly improved, they will be ready to provide peacetime pilots with the utmost in radio communications and direction-finding equipment.

LEARADIO the pilots' preference

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The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

YOU SHOULD KNOW MORE ABOUT THE ATSC

They're sort of a general store to the Air Forces.

Their formal name is Air Technical Service Command and the supply job they do is unbelievable! They keep a stock of more than 620,000 items—repeat: *620,000!*—ranging from a machine screw to a "dehydrated" hangar or a giant crane.

No matter where an American aircraft is (and, as you may have guessed, they're spread around some these days), the ATSC assumes the responsibility of keeping it supplied with all necessary spare parts, special equipment for its crews, and the items needed for equipping the base from which it operates.

For every $100 you spend on airplanes (with your War Bond purchases), the ATSC puts aside $60 worth of spare parts, supplies, and special equipment.

Get the idea?

Next time you're ready to buy $100 worth of War-Bonds-for-airplanes, better make it $160 to cover spares and extras!

PRESSURE POLITICS

What do you do when you start your engine?

You slam both eyes onto the oil pressure gage and watch it like a big, hungry hawk (Gulfhawk, of course. Adv.)!

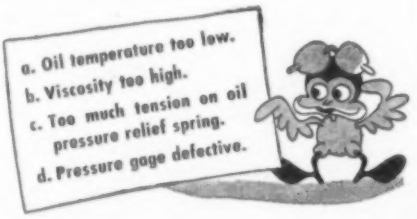
Why? Because oil pressure and oil temperature gages tell you whether you're

getting proper lubrication—and if you're not, you're not going to fly!

However, if your tanks, lines, coolers, and pumps are in good operating condition, you'll get correct readings on your oil instruments. Especially if the oil system is full of fresh Gulfpride!

For Gulfpride's *extra* refining step, the Alchlor Process, removes far more of the carbon-and-sludge hydrocarbons than are extracted by ordinary methods from lower-grade lubricants. And this super-refining makes Gulfpride a super-lubricant which will keep a super-film of oil between metal surfaces.

But if you should get oil pressure readings that were too high, here are some of the probable reasons:


a. Oil temperature too low.
b. Viscosity too high.
c. Too much tension on oil pressure relief spring.
d. Pressure gage defective.

Next month, we'll cover *low* oil pressure readings. Meanwhile be sure you're using Gulfpride Oil of the viscosity recommended by your engine maker.

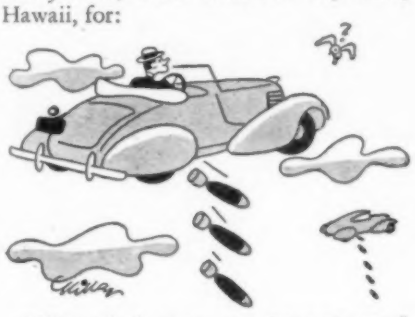
YOU TOO CAN BE A PERCH PILOT DEPT.

Very easy it is, too!

Just write your Little Known Fact About Well Known Planes—furnish proof—and send it to us at the Gulf Building. (Address right above.) If your "Fact" is super-astonishing, we'll print it, and that very day mail you your commission as Perch Pilot (br).

Do it five times, and we'll promote you to Senior Perch Pilot.

Flutter just mailed a commission to *Harry Will*, 2021 Kinoole St., Hilo, Hawaii, for:



"Wounded men are transported away from combat areas in a disposable-tank-like litter hung under P-38's!"

Billy B. Steed, PO Box 125, Leachville, Ark., says:

"On a six-hour mission, a B-17 uses enough gas (Gulf Aviation Gasoline, no doubt!) to run the average family car for three years!"

And *Jere Roe*, 1145 Chickawaw Road, Paris, Tenn., proved this statement:

"The distance between the pilot's left hand, and the co-pilot's right hand, when they are at their stations in the office of the B-29, measures 9 feet!"

Okay—let's have some more!

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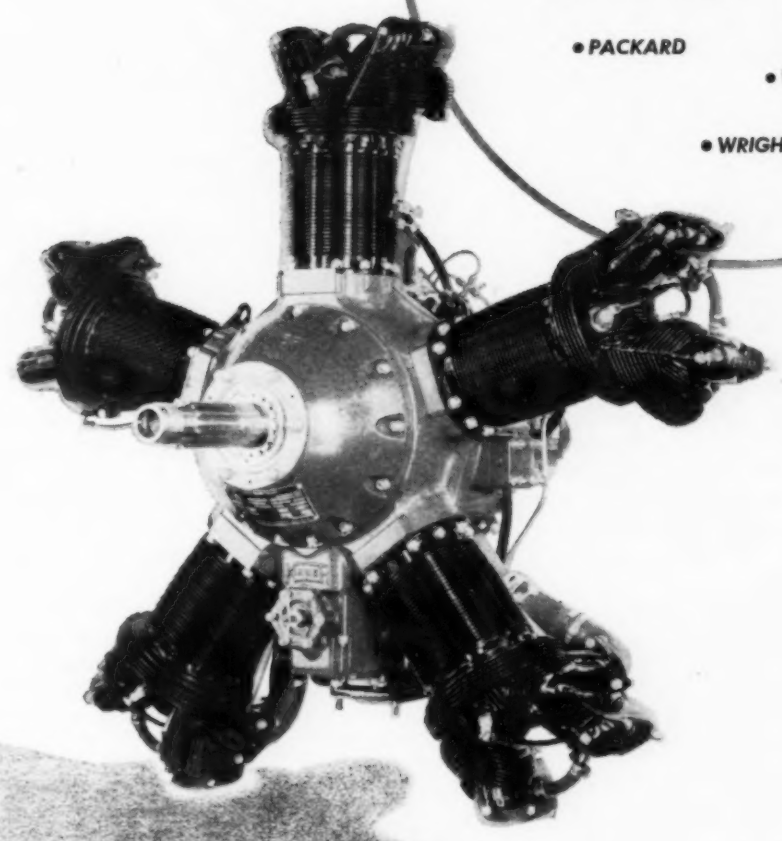
- WRIGHT



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AIR REPORT

SIGNIFICANT TRENDS IN THE NEWS

400-mph. Personal Plane

First private plane utilizing gas turbines to be planned for postwar sales is a twin-turbine executive transport of five- six-place capacity. It will have a 400-mph. top speed, according to current reports, and will sell for approximately $40,000. While such a price is far higher than most quotations now being given for postwar personal planes, there is considerable interest in such a plane among distributors and dealers familiar with the executive airplane market. One well known charter operator believes a 400-mph. plane would pay for itself on short order because of the demand for very fast transportation.

★ ★ ★

Aircraft and Airmen Directories Soon

The annual directories of certificated aircraft and airmen, published prior to the war by the Aeronautical Chamber of Commerce and discontinued in 1941, are to be made available in the near future, possibly September. CAA has called for bids and will soon award a contract furnishing necessary information on a fee basis to the successful bidder, who in turn will publish the annual directories with monthly supplements. The aircraft directory will carry a listing of every civilian aircraft in the United States including the name and address of owner, power plant, NC number and all other pertinent statistical data. The certificated airmen directory will provide all information on licensed pilots, including name, address, sex, type of ratings held, etc. It will be arranged by states and also supplemented monthly.

★ ★ ★

New Racket

Watch out for the "johnny-come-lately" consulting airport engineers who hold themselves out as experts on airports and are looking for fat fees from towns and communities contemplating the construction of airparks and landing fields. There are a few reputable consulting engineering firms well versed in airport construction and whose services and fees are legitimate. But there are others not so legit, a new racket and one that might prosper if not nipped in the bud, what with all the growing interest of communities to build or improve municipal airports. Best hedge is to check with regional CAA airport engineers, whose advice can be trusted.

★ ★ ★

Wired for Sound

A gadget is being developed to prove or disprove a flight instructor or examiner or student is right or wrong. The device, intended for installation in training planes, consists of a wire sound recorder and a hidden set of extra instruments. A movie camera is mounted in front of the extra instrument panel. The sound recorder picks up the conversation in the cockpit. With the film and the record, the entire flight can be reviewed and analyzed. Its value is obvious in more effectively bringing out student or instructional errors and in determining whether or not a student can fly satisfactorily in case an argument develops.

★ ★ ★

CAA Studying Small Airports

Persons seeking guidance on the design and construction of small airports for private flying are finding CAA engineers more helpful than they have been in recent years. Concerned heretofore with large-scale airport projects, CAA men have had to readjust their thinking and

GLIDAIR AIRCRAFT FINISHES...

From 5,000 revenue passengers in 1936 to 74,000 last year. That, briefly, is the story of Mid-Continent Airlines' growth. But even greater things lie ahead, including a new fleet of modern planes and important route extensions.

The Glidden Company salutes this enterprising airline and is happy to claim Mid-Continent as another satisfied user of Glidair Aircraft Finishes.

Like other important airlines, Mid-Continent has found there is a Glidair finish especially formulated to meet every aircraft requirement. Each shipment is laboratory-tested on government panels. And the greater coverage of these top quality finishes results in lower costs—as much as 50% *lower at the gun!*

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Exclusive with Fahlin is the special airfoil design that gives Fahlin propellers their outstanding "plus" in the propeller field—that helps to make Fahlin famous for superior performance.

Use a Fahlin propeller first, last and always for superior performance, strength and dependability. Get the most from your engine—use *all* those "horses"—and enjoy the added pleasure and pride that comes from having a truly fine propeller.

SPECIAL FAHLIN FEATURES

FINEST MATERIALS. Each propeller is made of selected birch lumber—thoroughly seasoned.

FINEST FINISH. Special, high quality Zapon varnish furnishes extra over-all protection from the elements.

PERFECTLY BALANCED and calibrated.

DOUBLE THICKNESS TIPPING provides greater strength on tips and leading edge. Another plus-factor of Fahlin propellers.

TRIPLE TIPPING AREA. Fahlin design includes more than the usual tipping area, thereby assuring lasting efficient service.

MOISTURE VENTS on tips and leading edge prevent warping, and maintain proper balance.

FLIGHTEX COVERING on blade tips gives added protection against cracking—reducing strain still further.

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Fahlin Manufacturing Co.
COLUMBIA, MISSOURI

engineering to the lower levels of practical construction of Class 1 and Class 2 fields, which do not need the elaborate drainage systems, paving requirements, grading, and lighting fixtures developed for larger, more costly projects. While CAA men have always been found eager to cooperate in every way possible, they just haven't had as much acquaintance with small airport construction as with larger new layouts. Some months ago, however, CAA regional airport men began preparing and assembling data on private flying airport requirements, and the Fifth Region published a handy, exceptionally practical handbook on small airports. It is understood the head office in Washington soon will make available a new handbook on small fields for the information of the public.

★ ★ ★

Lack of Competition Penalizes Jet

Because the Japs appear to have nothing to offer against them, Uncle Sam's new jet-propelled fighters aren't needed as seriously as earlier in the war. At least that's the only explanation many observers can find for cutbacks in jet output. In May the Army Air Forces cancelled scheduled production of Lockheed's F-80 at North American's Kansas City factory, which had spent months tooling up for the fighter. Latest report is that the Navy plans drastic curtailment of its jet program. As a result quantity production and large-scale experimentation both in the air and in the laboratories will be pared. While adequate aeronautical research during peacetime is vitally necessary, transitional economies might handicap jet development.

★ ★ ★

NATA Friction Brought to Head

There's a movement on foot in certain National Aviation Trades Association quarters to re-employ John H. Wilson, who resigned last year from the post of executive director. Internal friction over recent policies being pursued by NATA President Roscoe Turner and Acting Executive Director Clarence Mooney was to be resolved at a special directors meeting in Kansas City August 7 when action also was to be taken on employing a full-time executive director with headquarters in Washington. Wilson is reportedly holding out for $12,000 a year.

★ ★ ★

Civilian Plane Output Delayed

Piper Aircraft will not have demonstrators available as soon as originally expected. The Army has stepped in and requisitioned all of Piper's civilian production for several months. Piper planned to resume deliveries to the civilian market no later than August. But the Army says no. The ships are needed for ambulance work in the Pacific theatre. Taylorcraft is also having trouble. The postwar four-place T-Craft, scheduled for appearance at a large mid-west dealer and distributors meeting in Blackwell, Oklahoma, last month, suffered damage at the home field in Alliance. Luscombe, tooling up in temporary quarters at Dallas, reports steady progress on its postwar "Silvaire," which is to be an improved model of the prewar design.

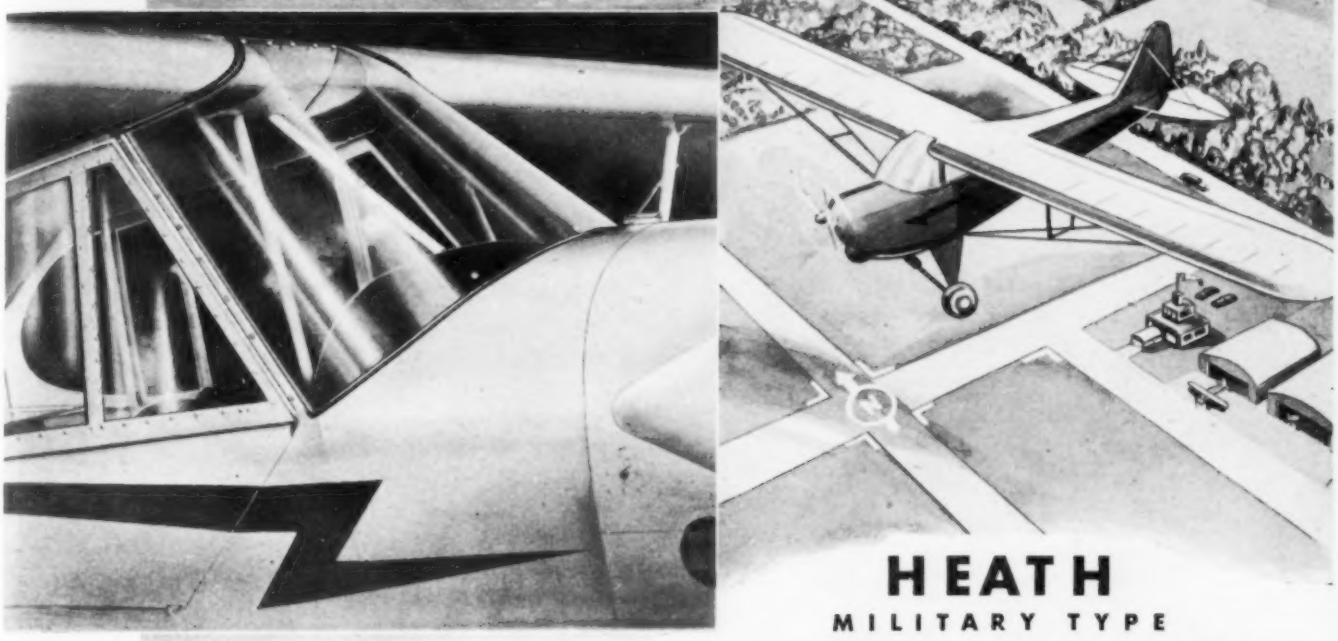
★ ★ ★

Boom in Air Jitneys

The nation's acute transportation shortage, developing out of military needs to redeploy troops across the nation earlier than had been anticipated, has caused a boom in air jitney work. One long-established charter operator, estimates there are twice as many non-scheduled passenger hoppers as were operating two months ago. The big volume is mostly West-bound, as airline schedules in that direction are more crowded than others. Old-timers predict the boom will subside as quickly as it began, and criticize the way some of the newcomers bird-dog passengers at cut-rate fares. "They are promoting airplane trips now like the jitney's did in 1915," one remarked. Meanwhile, proposals for the airlines to operate a "pool" of surplus Army C-47's to alleviate the air transport shortage are expected to result in relief soon.

★ ★ ★

Visibility Unlimited



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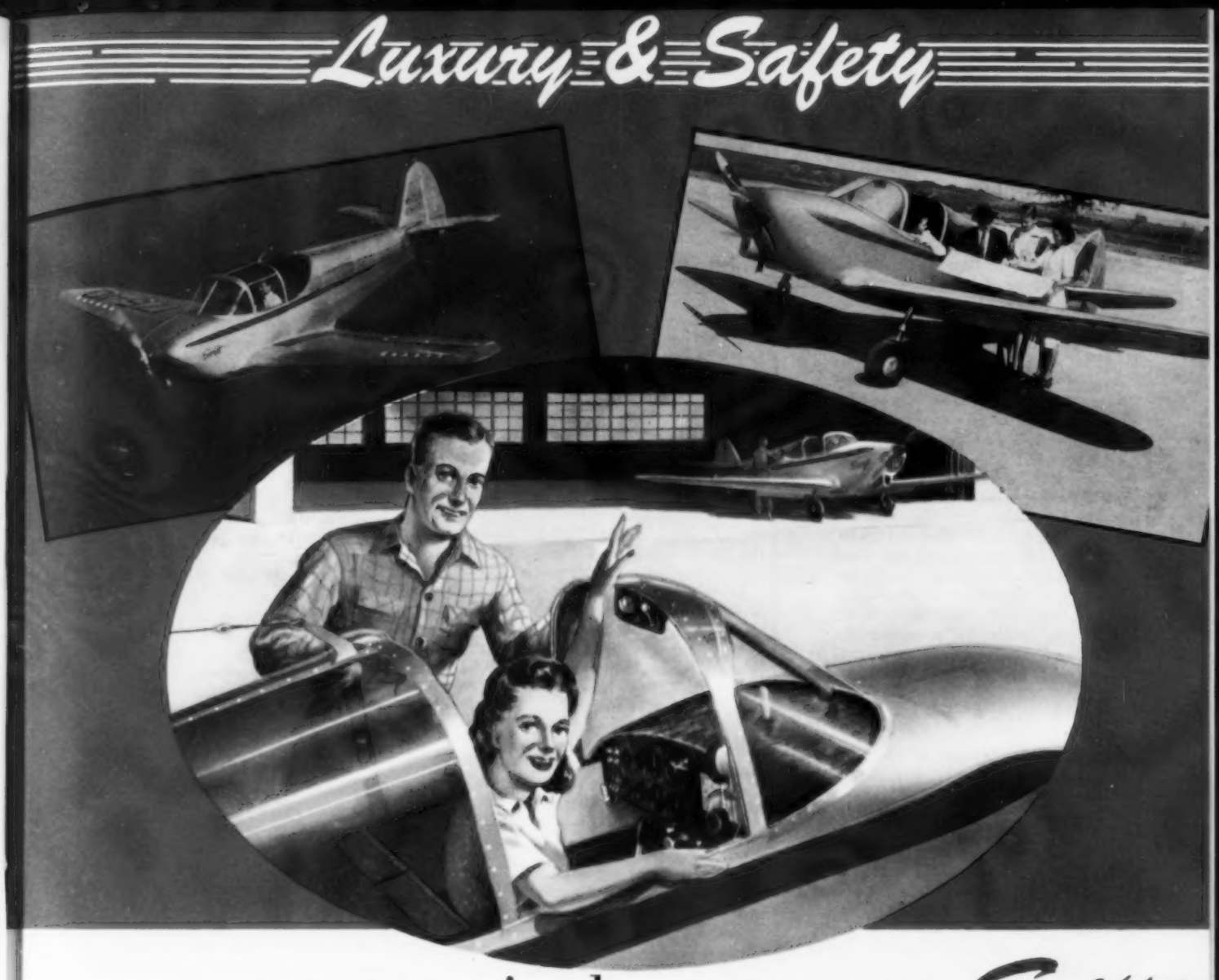

. . . are yours in the sporty new *Swift*

You will be proud of your new ***Swift*** with it's smart styling and inviting comfort. There is plenty of room for two six-footers in the spacious cabin . . . upholstered in rich, grained leatherette in your choice of red, blue, or green . . . durable and resistant to water and sun. Cabin trim harmonizes with upholstery. Hardware is chromium plated.

Body conforming seats are deeply padded . . . providing luxurious comfort and freedom from fatigue on long flights . . . an important feature, considering the ***Swift's*** 600 mile cruising range.

Ash trays, glove compartment, cabin heater, and cabin air vent are standard equipment, and the standard 12 volt battery is ample to handle 2-way radio, landing and navigation lights, and other electrical accessories. Ample luggage compartment behind the seats is easily accessible.

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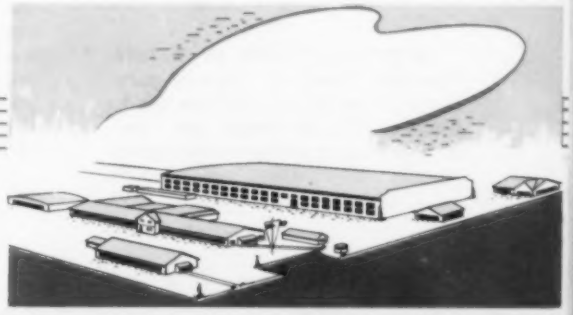
The Swift

Made by **GLOBE AIRCRAFT CORPORATION** Fort Worth, Texas

Illustrated booklet sent on request. Write to P.O. Box 4277-SO Fort Worth 6, Texas



REVVING UP

(Continued from page 4)

says it's so fast "you can drink six bottles of beer in El Paso and land at Dallas in plenty of time." . . . Lockheed's chief test pilot in Dallas, Ben Bransom, says the Shooting Star is the most sensitive aircraft he's ever handled and will out-roll anything. While cruising around the other day he ducked his head to adjust a rudder pedal and when he looked up the airplane was rolling around like a button on a taut string. "Soon as I found out which direction I was rollin' I let go of everything and she straightened right up, pretty as you ever saw," he said. . . . Joe Towle, chief of all Lockheed test pilots, says one of his boys came down one day with the complaint that the P-80's wingtips were vibrating too much. "Go back up, trim her good, leave the stick alone, and see what happens," Joe told him. When the pilot came back he was all smiles. "That airplane's so sensitive I can count my pulse by gripping the stick and timing the wingtip vibrations," he said.

★ ★ ★

IN THE AIR: Almost a completely new airplane all the way around, North American's new P-51H super Mustang has a Packard-built Rolls-Royce V1650 engine delivering over 2,000 hp., has a top speed of over 460 mph., climbs 26 per cent faster than the P-51D, has a new wing section and new empennage, and has a range 37 per cent greater than its predecessor. . . . A new unofficial American altitude record was set April 30, 1943, by Chief Pilot Joe Towle of Lockheed when, in great secrecy, he flew a P-38 to 44,940 feet. It was a piggyback Lightning, and with him was Col. Randolph Lovelace, chief of the Army's aero-medical laboratory, the mission being to test a new forced-feed oxygen mask. Trouble in their outside temperature gauge caused them to halt climbing just sixty feet below their goal and return to land, but their altitude was the highest ever achieved by a reciprocating engine airplane in the U. S. The world record of 56,046 feet was made in 1938 by a specially-built Italian Caproni plane. . . . On July 11, 1945, Boeing Test Pilot James Fraser flew a B-17 to 43,499 feet, believed a new world altitude record for a four-engine airplane. It was a regular altitude test flight.

★ ★ ★

DROPPING PLANES BY 'CHUTE: The new "baseball" type of parachute designed for military use by General Textile Mills, Inc., constructed as a perfect hemisphere equally distributing all stresses throughout the canopy and thereby eliminating oscillation, is to be used in a safety demonstration at Chicago during August to drop a Piper Cub into Lake Michigan. Plans are to release the 'chute after cutting the engine at 2,000 feet.

★ ★ ★

SPECTACULAR WARNING: An Army B-25 which collided with the Empire State building in a fog last month dramatically emphasized the need of full development and application of radio and radar aids for instrument flying. The day before the collision CAA experts had consulted with Panoramic Radio Corporation of New York on the possibilities of installing on the Empire State an anti-collision device known as the stratoscope, developed by Panoramic and the Kollsman Aviation Instrument Division of Square D Company. Spokesmen said a stratoscope system would have emanated radio signals in all directions from the building, and the B-25 pilot, if equipped with a receiving instrument, would have known of the hazard. Not radar in principle, the stratoscope embodies proved principles of radio and the use of a sensitive aneroid diaphragm altimeter.

★ ★ ★

Latin Americans Shy at "Dominator" So B-32 Nameless

The War Department censored out the name "Dominator" from our B-32 article on page 27, and called as we went to press to say the B-32 doesn't have a name any more, and would we omit any reference to Dominator?

We learned later the newest super bomber lost its name in a fit of State Department indignation thrown by Archibald MacLeish, Assistant Secretary of State and protector of goodwill, cultural relations and whatnot among the United Nations.

MacLeish, it seems, found "Dominator" unfortunate and in extreme bad taste, diplomatically speaking —the Latin Americans would be offended if the colossus of the North were so careless as to use the name. Besides, it doesn't rhyme with the Four Freedoms.

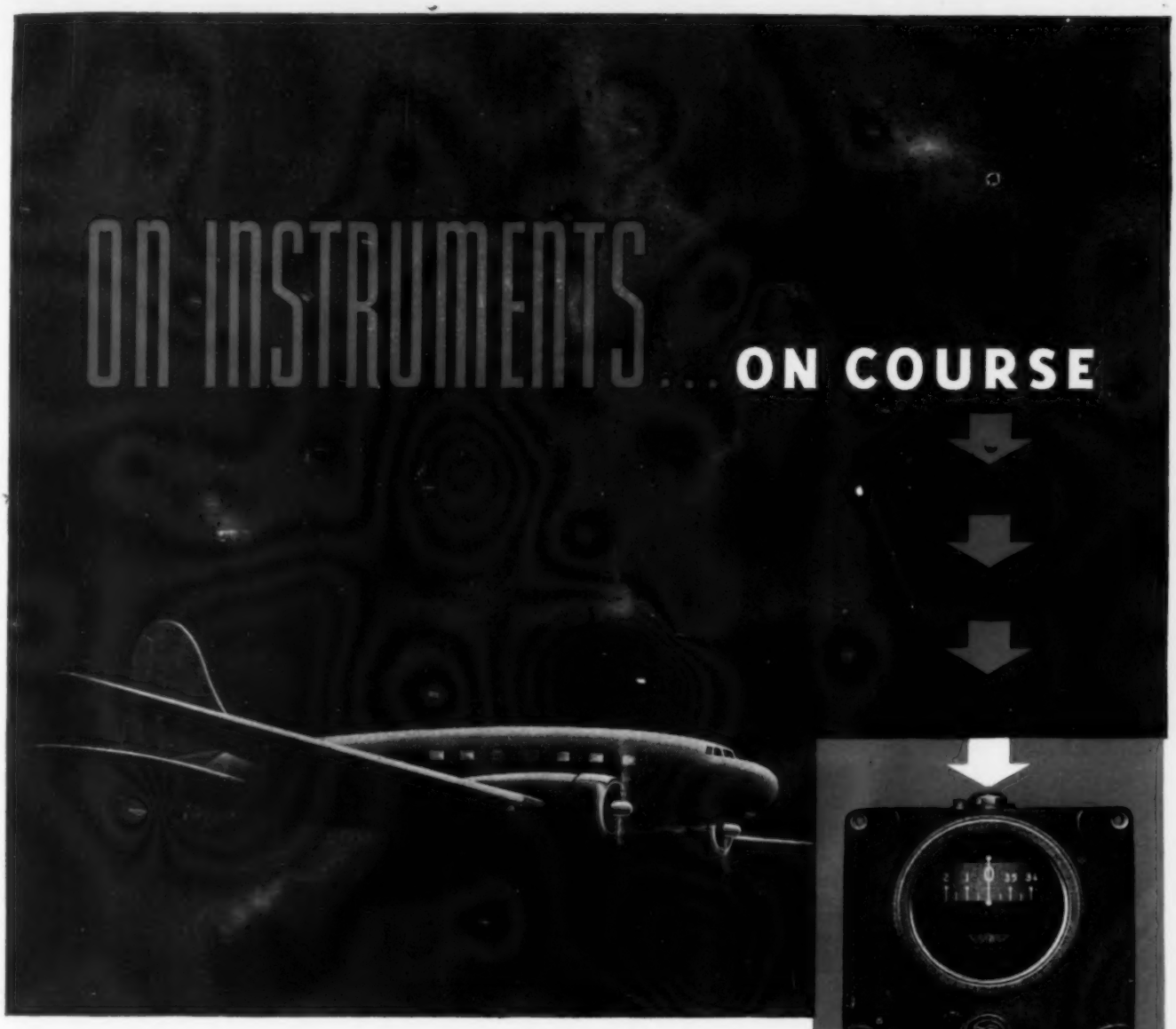
It made no difference that the Army Air Forces had officially named the B-32 last year — the War Department agreed with the State Department that the B-32 had either to be renamed or go along as just plain B-32. To help things, MacLeish suggested they call it "Terminator," but that didn't ring any bells at all.

So the B-32 is currently going around without a name.

SHORT SNORTS: Wayne W. Parrish, globe-trotting editor of American Aviation, now on an Aviation Writers Association air evaluation writing mission with the AAF in Europe, writes us as follows: "The bombing of German cities is beyond description. Air power sure won the war." . . . Bill McDuffee, AAF Colonel and well known figure in southwestern aviation circles, has assumed command of the Eastern District, Air Technical Service Command, New York. Bill represented the AAF at the Ford Motor Company's River Rouge Plant early in the war and, from 1942 to May of this year, served as AAF regional representative for the Detroit region. . . . Major Richard Bong's death will be mourned throughout the Allied world—most decorated ace of the war, Bong, with forty Jap planes to his credit, met his death while testing a P-80 jet-powered "Shooting Star" in California. . . . Comparable loss to the British was the death last month of Wing Commander A. O. Moffat, a pioneer of early jet experiments in England and senior test pilot of Power Jets, Inc. Moffat crashed during an air show near Whetstone. . . . Dr. Irston R. Barnes has resigned as the director of the CAB economic bureau and has been named economic advisor to the Board. Russell B. Adams, assistant director of the economic bureau, has been elevated to the position vacated by Dr. Barnes. . . . The first contract, non-scheduled air-freight service on the West Coast will be owned and operated by veterans of the Chennault's Flying Tigers and the India-China "Hump" operation. Known as the National Skyway Freight Corporation, the company will use seven Conestoga twin-engine transports built originally for the Navy by the Edward G. Budd Manufacturing Company. . . . Congratulations to our good friend Major R. W. "Shorty" Schroeder, who has just received the Distinguished Flying Cross for his pioneering work in high altitude flights. Shorty is partially paralyzed from the results of his early experiments, but is slowly recovering at his home in Glenview, Illinois. He wants to know if any SF readers know of anyone who has suffered from paralysis of one side of the body and recovered. . . . CAB findings in the highly-publicized Page Airways case involving a fatal accident on Washington National Airport reveal that one of the Lodestar engines failed on take-off due to a cracked valve spring washer which had been condemned by the manufacturer but not replaced by the Army before sale of the surplus ship to Page. . . . Col. William Westlake, former director of Army Air Forces, public relations, has shown up in Germany. He has been assigned to the Air Division, Allied Group Control Council. Westlake was succeeded in the PRO job two months ago by Col. Rex Smith, who in turn has been replaced by Col. Harold W. Bowman.

★ ★ ★

ON INSTRUMENTS... ON COURSE



Sperry Directional Gyro

Sperry Gyro-Horizon

THROUGH the blackest night—this pilot stays *on his course . . . on instruments.*

The two old faithfuls, the Sperry Gyro-Horizon and Directional Gyro, have taken the mental gymnastics out of instrument flying.

With the Gyro-Horizon the pilot has an *attitude* reference within the airplane. He can tell whether the plane is banking, climbing, gliding, or flying level . . . *without outside visibility.*

For directional indication, the Directional Gyro gives the pilot a reliable reference within the airplane regardless of turns, banks, glides, or climbs. He can fly straight courses and make precise turns . . . *without outside visibility.*

Since 1929, over 250,000 pairs of these instruments have been supplied to military and commercial services. They are standard equipment on all airlines.

The Sperry Gyro-Horizon and Directional Gyro may now be obtained in two basic types, air driven or electrically driven.

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So sorry!

DIRECT HITS on the huge aircraft plant at Omura near Nagasaki are scored by the first wave of B-29's. More to come. *Official Photo U.S.A.A.F.*

The hell we are! The little yellow men up Tokyo way just can't seem to take a hint. Germany learned — the hard way. German top-ranking General Von Rundstedt freely admitted that Allied bombing had smashed Hitler's power to fight back.

But in Europe all we used were the "little" Fortresses and Liberators which could only carry three or four tons of bombs. The Superforts, however, tote up to ten tons. *And fast!*

The Japs are getting a tiny sample right now of the destruction these planes can deal out. If they were smart they would haul out the white flag now before they find themselves on the receiving end of 2000-at-a-clip bomber attacks.

But if they don't . . . they'll just have to take it. And dishing it out will be vast fleets of these powerhouse Boeing B-29's, for whose great Wright engines we at Chandler-Evans are proud to be turning out precision-built carburetors. And sticking to this job is the best way we know to help ram Hirohito's face down his throat.

CECO

CARBURETORS
FUEL PUMPS
PROTEK-PLUGS

CHANDLER-EVANS CORPORATION

SOUTH MERIDEN
CONNECTICUT, U. S. A.

Oversized fins mark Consolidated Vultee B-32. Slightly smaller than B-29, it can carry larger bombs, is more maneuverable. Ten .50-cal. machine guns are mounted in manually-controlled nose, top, belly and tail-powered turrets.
—(Convair Photo.)

Super Liberator

By TOM ASHLEY

BESIDES the engines, which are identical, there isn't much resemblance between the B-32, latest super bomber to be revealed by the Army Air Forces, and the B-29, to which the new bomber is supposed to be a "stablemate." It is more of an enlarged B-24.

But its first combat pilots describe it another way. To them the 32 is "a four-engine B-26." That's their way of saying the B-32 is (1) very fast, (2) highly maneuverable, (3) pretty "hot" on the ground and in the air, and (4) possessed of that admirable quality to "get the hell out of here" with plenty of zip when the going gets rugged.

Although production of B-32's was drastically slashed last May in the Army's far-reaching cutback for a one-front war following Germany's collapse, and is due to cease altogether by January 1, the bomber possesses several remarkable characteristics and features. Specifications and performance include the following:

Wingspan, 135 ft.; length 83 ft.; height, 32 ft. 2 in.; power plants, four Wright Cyclone 18 engines rated at 2,200 hp. for take-off; propellers, four-bladed, reversible pitch Curtiss Electrics of 16 ft. 8 in. diameter; gross weight, 100,000 lbs. with 120,000 lb.

alternate; empty weight, 60,272 lbs.; tactical range, over 3,000 miles; maximum speed, over 300 mph.; stalling speed, 99 mph.; service ceiling, over 30,000 ft.; armament, ten .50-cal. machine guns; bombload, over 10 tons; crew, 8.

Chief differences between the B-32 and B-29 are that the former is not pressurized, has manually-operated power turrets instead of remote-controlled guns, is somewhat smaller and six tons lighter than the 29, has a high wing, has larger bomb bays, and has a conventional flight cabin with cowling and protruding windshield.

Armament

More fire coverage than is possessed by any other heavy bomber is claimed for the B-32. It carries five turrets, each mounting twin .50-calibre Browning M-2 guns. Sperry ball turrets are located in the nose, tail and belly, and Martin turrets, with streamlined plastic covering, are mounted atop the fuselage. Nose and tail guns move 150 degrees from side to side and 120 degrees up and down, turning nearly twice as fast (ninety degrees per second) as those on any other bomber of the B-32's type. All turrets are heated and equipped with the latest computing and compensating sights. Fibreglas flak curtains are installed at crew stations.

Stripped for Specialized Role

A glance at the B-32 reveals its massive tail fin as its most distinguishing mark. Jutting 32 feet 2 inches skyward, it gives the plane unusual stability and greater maneuverability than has been achieved by any other airplane of similar size. In flight the 32 rides nose high at about the same attitude which characterizes the B-26 Marauder, which also has an elongated tail fin.

Designed and manufactured by Consolidated Vultee Aircraft Corporation, the B-32 originally was a twin-tailed bomber like the Liberator, equipped with pressurized cabins and remote-controlled gun turrets like the B-29. First engineering on the XB-32 began at Convair's San Diego plant in late 1941, but after exhaustive tests with three X models, the project was transferred to Consolidated Vultee's Fort Worth Division where, in February, 1943, the B-32's fuselage and empennage, its engine and armament installations, and its high-lift, low-drag Davis wing were entirely redesigned.

Throughout its development the B-32 has been subjected to change . . . design, modification, equipment, contract quantity and the like. Although the original XB-32 made its first test flight on September 7, 1942, two weeks before the first XB-29 flew, development lagged considerably behind that of the Superfortress, which entered combat on June 5, 1944, over a year earlier than the B-32. As a result, the B-32 emerged with numerous battle-tested improvements and innovations. B-29 observers, technicians and pilots were returned from the air war over Japan to the Fort Worth factory where they worked with designers and production officials to effect changes required by fluctuating combat demands. Thus, while B-29 production was accelerated on an ever-increasing scale, the B-32 underwent wholesale change and modification to become literally stripped down for specialized action in the strategic offensive against Japan.

More Conventional Than B-29

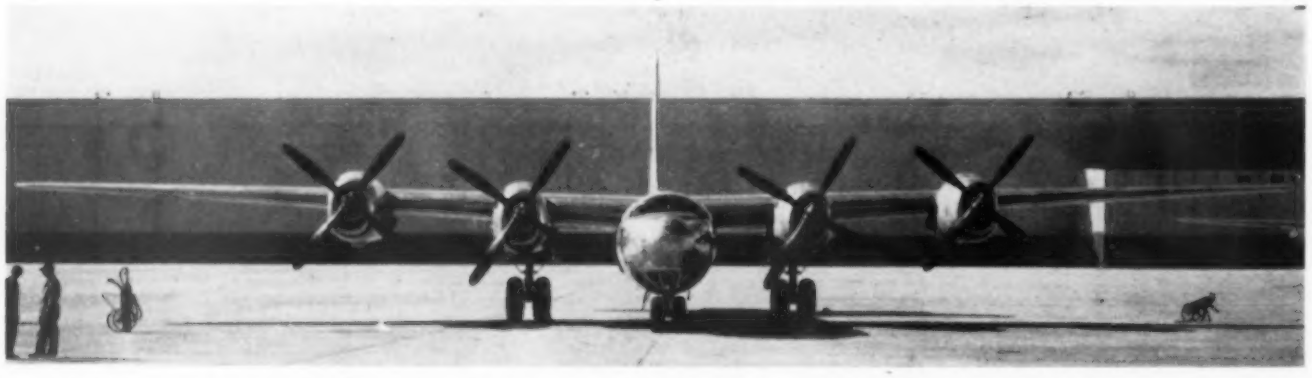
Closely inspecting the plane inside and out, you can recognize the changes and their significance. There's nothing "beautiful" to look at in the B-32. Big, it's stubby, ungainly and pugnacious in appearance. Its cylindrical fuselage is blunted at the nose and chopped off at the windshield. Its high wing demands long, complicated-looking landing gear, with the dual, 56-in. wheels (same diameter as B-24) retracting completely inside the inboard engine nacelles.

Climbing into the flight deck, you find it much more conventional than that of the B-29. Boeing stretched the nose cabin a little to install a flight engineer in a compartment behind the pilots, from whom large quantities of engine instruments were appropriated so as to provide abbreviated twin instrument panels of knee height, over which the pilots look through the rounded nose glass. But Consolidated Vultee kept all the instruments where they have always been—on the pilot's panel—sliced a cowling out of the nose, and still had room for the aerial engineer. His station is in the middle of the instrument panel—he sits on the floor between the airplane commander (pilot) and co-pilot, and the three of them fly the airplane side by side, the engineer being instantly available without note passing or intercom conversation. Up front in the two-decker nose are the bombardier and nose gunner.

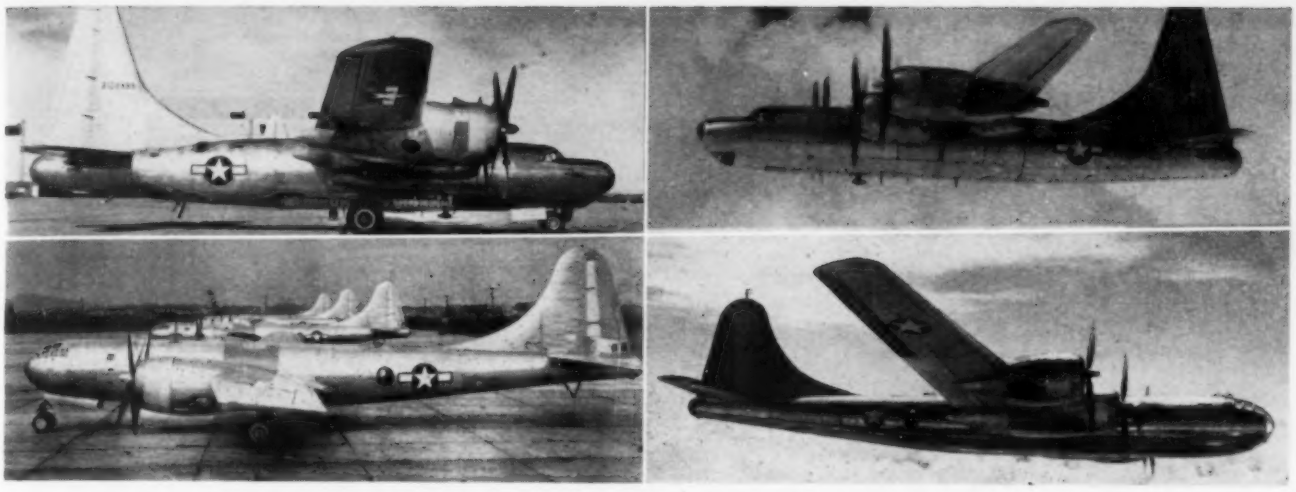
The second cabin contains another gunner, who is also radio operator-navigator. Connecting forward compartments with the center gunnery cabin are the double bomb bays, with passage along a roped-off catwalk such as in the B-24. The original pressurized XB-32 had a little push cart mounted on tracks inside a tunnel through which crewmen scooted between nose and rear cabins. As in the Liberator, the bomb bay doors are of sliding type, opening upward along the curve of the fuselage (the B-29's bomb bay doors swing open as on the B-17). The center cabin is large and excellently sound-proofed, but its small portholes offer scant visibility. Folding bunks are provided for crew comfort on long missions. Spaciousness and visibility feature the tail gunner's cabin beneath the towering tail fin.

Reversible Props for Braking

Two pioneering developments in the



Front view of B-32 emphasizes circular fuselage, high wing, 32-ft. 2-in. fin. Davis wing, similar to B-24's, is used. —(Convair Photo.)



DIFFERENCE IN APPEARANCE OF SUPER BOMBERS is shown in these photos of the B-32 (top) and B-29 posed in similar attitudes. B-29 streamlined nose is longer, engine nacelles protrude farther, mid-wing is much closer to ground for short landing gear struts. Flight pictures show B-32's characteristic nose-high attitude, thinner wing, conventional flight deck elevation, over-sized fin and shorter fuselage. —(Upper Photos by Convair, lower by Boeing.)

B-32's equipment are its reversible-pitch propellers and an ingenious Curtiss device which automatically synchronizes engine speeds. Use of reverse propeller thrust for aerodynamic braking, the first application of its kind on large, quantity-produced land-based planes, shortens the B-32's landing run about 30 per cent, reduces taxiing time and tire wear, and increases maneuverability on the ground. Curtiss and Consolidated Vultee engineers estimate it is possible to cut wheel brake weight in half through the use of reverse thrust propellers.

While the combination of Curtiss automatic synchronization and reverse thrust propellers on the B-32 is the first production installation of both features on a large land plane, the synchronizer has been a part of the propeller system of the PB2Y-3 Coronado flying boat for the last five years, and reversible propellers have been used for several years on flying boats to improve their water maneuverability. The synchronizer provides constant speed control for each of the four engines by altering propeller blade angles, thus maintaining accurate synchronization throughout various flight conditions. A single control, operated by the aerial engineer, sets the pace for all of the propellers.

Maneuverability Shown in Flight

Taxiing out for our first flight in the B-32, we became acquainted with the reversible propellers during engine run-up, when the engineer flipped a switch and re-opened the throttles. A shrill whine signalled the blade reversal. On our plane, only the inboard propellers were reversible.

After checking this and 79 additional items on a carefully prepared list, our Army crew took off with plenty of run (about 1,500 feet before the wheels left the concrete) and speed (about 115 mph.). He held the nose down for quite a distance before easing the bomber skyward. Its labor was noticeably lessened when the big landing gear had been retracted, and we climbed to about 700 feet before banking gently into a climbing turn, the 32 picking up speed at a fast rate. We cruised at 215 mph. and reached 225 as the pilot demonstrated the aircraft's maneuverability. Mentally comparing our flight with a ride we made in a B-29 during May, 1944, it wasn't difficult to see that the 32 is more maneuverable, a little "hotter" to handle, faster on acceleration and generally livelier because of the weight differential (it's actually about 12,000 pounds lighter). After watching the aerial engineer fan a wide assortment of switches and gadgets, we waded through the bomb bay catwalk to the center cabin to see how it rides amidships. Just as we had settled down to lean against the padded wall, the big bomber lurched and we found the ground whirling through the nearby porthole. He was banking at least 45 to 50 degrees, and the steepness and suddenness of such a turn in an airplane of the B-32's dimensions was something to experience.

Use of reverse thrust aerodynamic braking in landing was the highlight of the flight. Full flaps slowed the bomber very effectively, but concrete was touched at about 105 mph. Immediately we heard the whine of the propeller reversing mechanism as the engineer threw a switch just when we touched. The throttles had already been closed, and as the blades twisted from positive angle through zero and then to negative angle, the engineer goosed the throttles quickly. As a result the inboard propellers began pushing the air, and the effect of 4,000-plus horsepower in negative thrust was quick to slow the forward movement. There was no sudden stopping or abruptness—just a strong cushioning effect, as if invisible shock cords were exerting a determined backward pull. The landing run was halted within 1,200 feet after touching the runway. Consolidated Vultee engineers say emergency landings by combat crews are possible on small runways, such as fighter strips. Reverse propeller thrust also prevents ground-looping on muddy or icy fields.

Although the 32 isn't pressurized, it carries a superabundance of bottled oxygen. The fuselage is literally lined with these tanks and a unique oxygen pipeline system—each crew member's station is supplied with two oxygen lines, the rupture of either one of which will not impair his oxygen supply. In addition, portable walk-around oxygen bottles hang from the walls in numerous places throughout the plane. Enough oxygen is carried to supply the eight-man crew for twenty-one hours at an altitude of 35,000 feet.

Wing

Unique engineering went into the B-32's Davis wing. Its outer wing panel is virtually identical with that of the B-24, but an additional twenty-five feet in the center section boosted the span from the B-24's 110 feet to 135 feet. Flap area was increased to provide higher wing loadings than were possible on the B-24, and the B-32 has one of the highest wing load-

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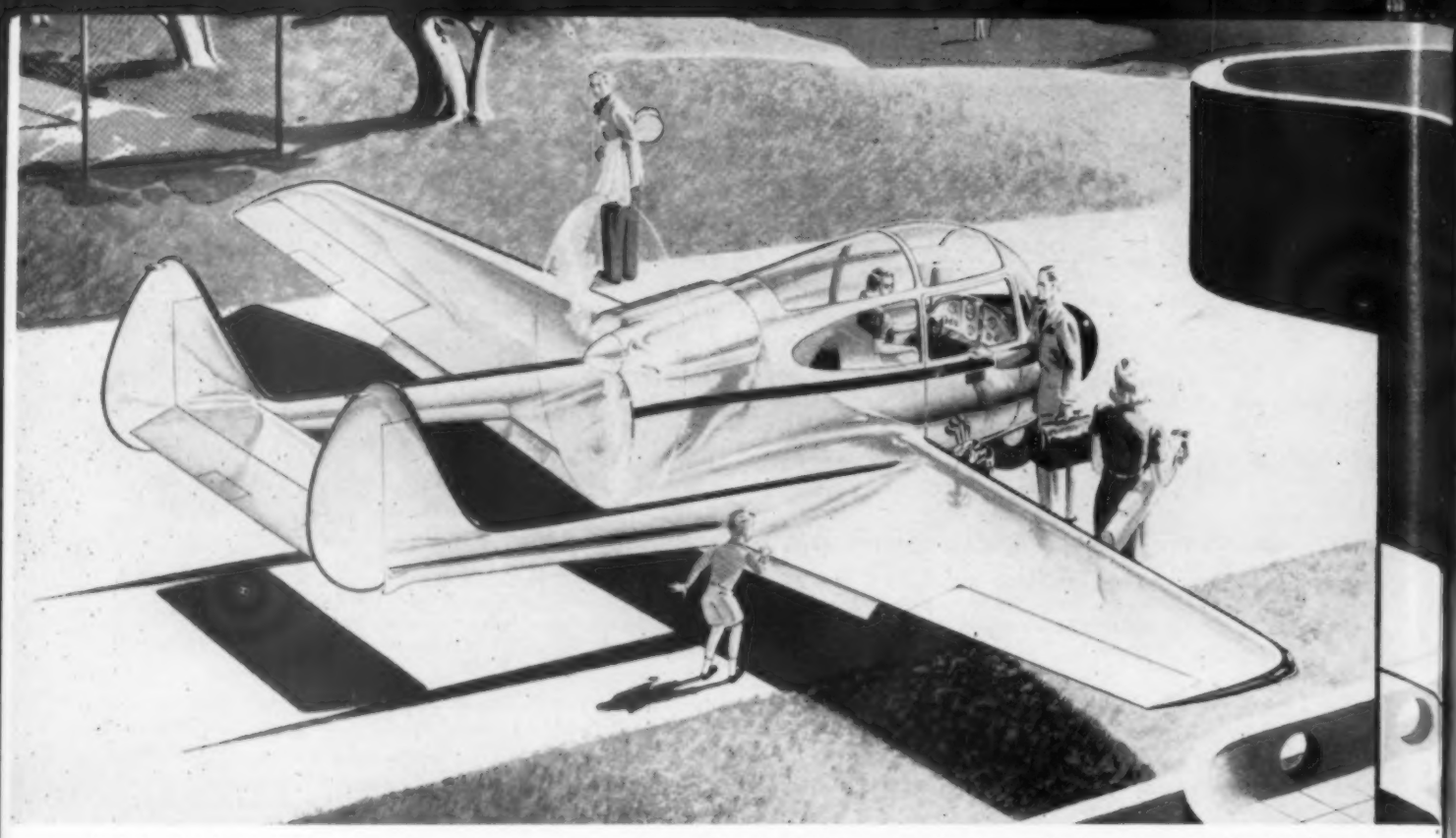


Artist's sketch of 190-hp. four-place Skycraft shows pusher engine installation, protective "propeller fence" provided by twin booms, and low-to-ground, auto-type passenger compartment. Same chassis is planned to take 100-hp. engine for two-place version, 125-hp. engine for three-place model. Only alterations would be power plant installation and seating equipment.

Variable-Load Design For Personal Airplane

With safety as chief goal, a California firm plans a standard airframe to carry three sizes of engines and passenger accommodations.

AN approach to the long-sought ideal of a standard airplane chassis on which to install different power plants for variable loads is being undertaken by Skylark Manufacturing Co., Inc., of Venice, California. It has developed a low-wing, twin-boomed pusher design with automobile-type cabin, and with the same basic chassis plans to market three different "sizes" of all-metal personal planes — sizes meaning two-place, three-place and four-place capacity although the airplane's dimensions remain identical.

Some ten years ago the company developed a low-wing, two-place, side-by-side personal plane powered by a 125-hp. Warner. Its performance caused considerable comment, but the company sidetracked development during the war to concentrate on military contracts for aircraft components. Dwight W. Huntington, whose accomplishments have included notable design pioneering for Stinson, including perfection of the first push-pull control yoke, was obtained and as chief engineer has been working on the Skylark idea for some time now. Test flights are expected some time in September, and production is planned for early spring.

Specifications and Performance

Huntington's specifications for the 4-place model, powered by a 190-hp. engine are as follows:

Wing span	37.5 ft.
Length	24.5 ft.
Height over rudder	6.8 ft.
Wheel tread	9.0 ft.
Wheel base	8.6 ft.
Wing area, including flaps, ailerons	200 sq. ft.
Flaps (4)	30 sq. ft.
Ailerons (2)	23 sq. ft.
Weights and Performance	
Four passengers	680 lbs.
Luggage	80 lbs.
Fuel, 45 gals.	270 lbs.
Oil, 3 gals.	23 lbs.
Normal load	1,053 lbs.
Optional equipment	187 lbs.
Disposable load	1,240 lbs.
Airplane net	1,440 lbs.
Airplane gross	2,680 lbs.
Power loading	14.1 lbs. per hp.
Wing loading	13.4 lbs. per sq. ft.
Hp. per passenger	47.50
Stalling speed	49 mph.
Cruising speed	135 mph.
Maximum speed	150 mph.
Cruising range	600 miles
Initial climb	750 ft. per min.
Service ceiling	16,000 ft.

While these figures apply to the 190-hp. model, the two-place and three-place versions are both essentially the same low-wing pusher airplane, variations being in power plants, seating and luggage. The two-place model will have 100 hp., and the three-place 125 hp. Huntington declares all three versions are "eligible for use with Class

l airports in compliance with rulings of the Civil Aeronautics Administration." His figures for useful load, cruising and maximum speeds, and rate of climb appear to be somewhat optimistic. They are for the 190-hp. model, and it seems they would have to be altered considerably for the two-place model, which would have 90 hp. less power but still have to carry around the same wings, booms, and basic passenger compartment used for the 190-hp. version. Considerable compromise in performance is indicated.

With these specifications and performance figures serving as background, Huntington's views of the new series, called "Skycraft" by the firm, bring out some interesting considerations.

Safety Principle Goal

"Considerations of safety, utility and economy underwent careful analysis in the preliminary designs, and of these safety loomed as the paramount problem," he explains. "The pusher type's increased safety through superior visibility is still further enhanced by swept-back wings and tricycle landing gear. Placing the ship in a sensible, level and comfortable position on the ground as in the air affords the utmost visibility in taxiing, taking off and landing. Similarly the tricycle gear permits safer and shorter landing runs through full use of wheel brakes and easy, adequate directional control, the ship being instinctively steered by the manual control yoke instead of by brake pedals. Wide tread and long wheelbase in conjunction with low center of gravity are ideally suited to the personal plane.

"Any consideration of safety must include reasonable landing speed — that is, a safe speed to which automobile drivers are accustomed. Very large wing flaps are used in the Skycraft design, and the heaviest version can be landed under fifty miles per hour, the lighter models considerably less. Large wing flaps provide the additional advantages of steeper climbing and gliding angles, enabling use of moderate-size fields with safety.

"Taking into consideration the unfortunate fact that engines lose power with wear, we seek additional safety through reserve power and useful service ceiling, rather than high speeds.

Two-Control Type

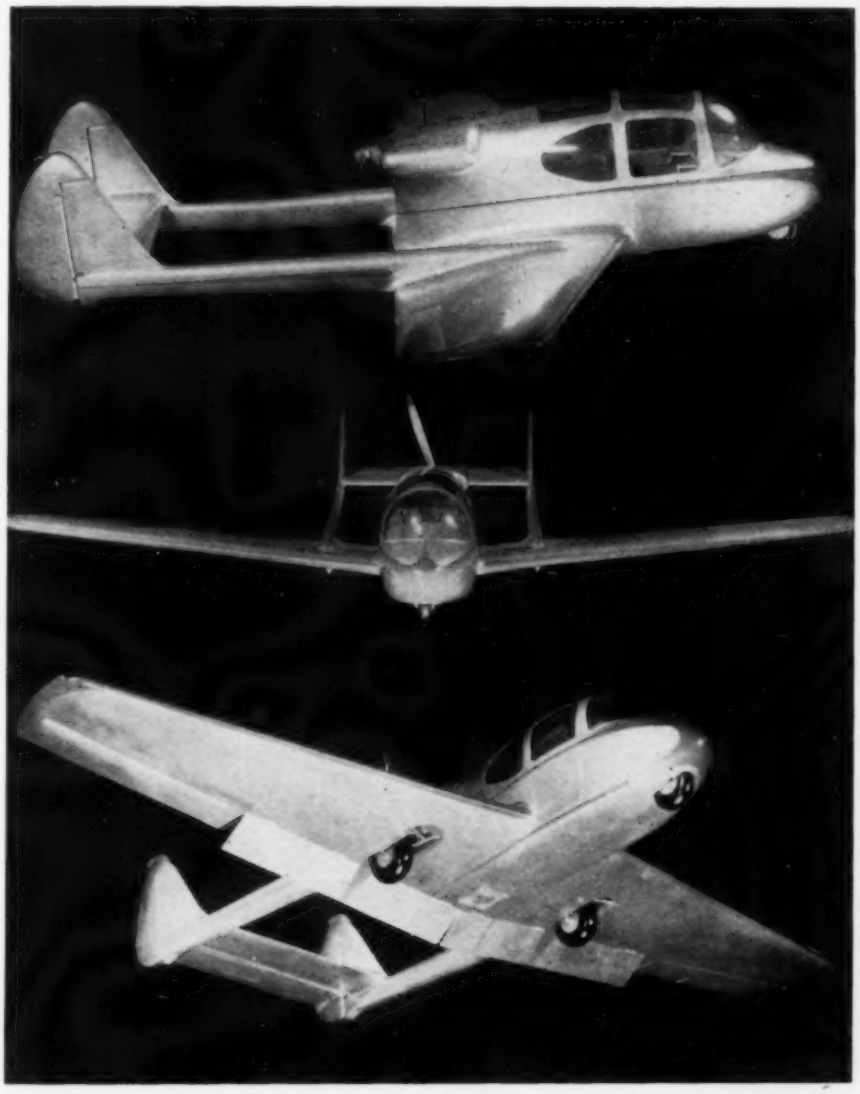
"The variable loads — extra passengers and luggage — have been placed near the center of gravity, thereby keeping the maximum fore and aft center of gravity positions in close proximity. Trim tabs have been provided on the elevator and left aileron and all primary control surfaces have been dynamically balanced to reduce physical effort. The twin fins and rudders are outside the propeller blast to avoid the adverse yaw effect of prop wash on vertical body and tail surfaces at varying speeds.

"The modified wheel-type control yoke enabled complete removal from the cabin of all hazardous and unsightly control columns, cranks, brackets, cables and such. All three primary controls will be jointly actuated in a two-control hookup. Conventional rudder pedals may be installed as optional equipment. Similarly, a dual or student control yoke unit is available to be installed by placing and safetying of only two bolts.

"Seats have been designed for extreme comfort and the front pair are easily adjustable for both height and leg room. They can also be sent forward, permitting easy access to rear seats and luggage compartment. The body interior follows the best automobile practice. Arm rests are provided and individual foot rests for rear seat occupants. A wide door on each side operates its own disappearing step for convenient access and egress without the usual climbing and balancing so disconcerting to occasional users of personal planes.

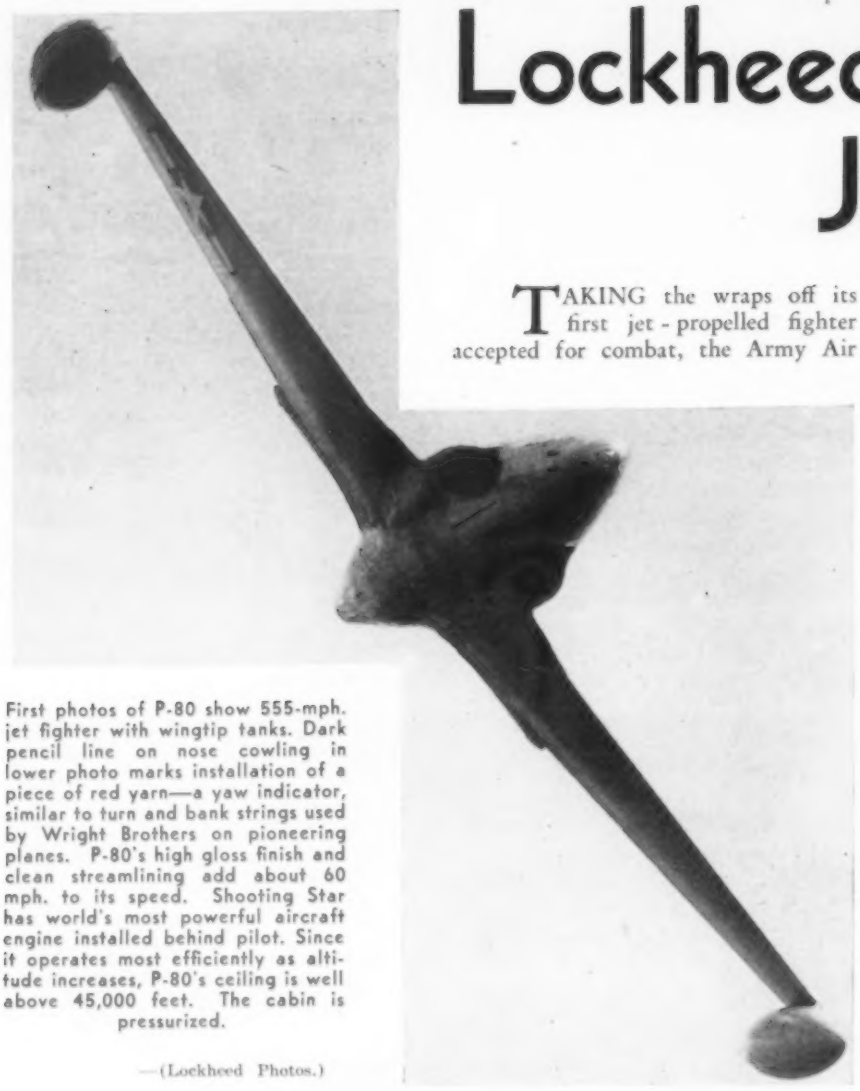
"The pusher engine installation offers safety from propeller accidents on the ground. Not only are the doors in front of the wing, but the tail booms and the broad stabilizer in the rear actually serve as a fence to enclose the propeller. Users have no reason to be near the propeller, since the engine is started from the cabin."

Prices for the three models have not been announced, but Huntington says the company plans to offer the four-place version for about $5,000 to $6,000. ★ ★ ★



Photographs of model illustrate design features of Skycraft. Large flaps extending across underside of fuselage improve rate of climb as well as reduce landing speed. Weight of landing gear is reduced by mounting wheels partially inside wing and nose. Low-slung cabin has auto-type doors which automatically lower folding step to facilitate access and egress. All-metal construction is planned.

Lockheed's Jet Fighter



First photos of P-80 show 555-mph. jet fighter with wingtip tanks. Dark pencil line on nose cowling in lower photo marks installation of a piece of red yarn—a yaw indicator, similar to turn and bank strings used by Wright Brothers on pioneering planes. P-80's high gloss finish and clean streamlining add about 60 mph. to its speed. Shooting Star has world's most powerful aircraft engine installed behind pilot. Since it operates most efficiently as altitude increases, P-80's ceiling is well above 45,000 feet. The cabin is pressurized.

—(Lockheed Photos.)

TAKING the wraps off its first jet-propelled fighter accepted for combat, the Army Air Forces has revealed new facts about the Lockheed P-80 Shooting Star, described as "the world's fastest airplane." An Army-flown P-80 recently flew from Dayton, Ohio, to LaGuardia Field, N. Y., in sixty-two minutes, averaging 555 mph.

Powered by a General Electric "super" jet turbine developing "a maximum thrust several times more powerful than the reciprocating engine used on the P-38," the propellerless P-80 is being used by AAF combat squadrons now in training at Muroc, Calif. Six .50-cal. machine guns mounted in the lower-half of the nose are fired by use of an automatic gyro-computing sight equipped with a reflex optical system.

Bombs or auxiliary fuel tanks are mounted beneath the P-80's wingtips. Engineers explain the drag is less at that point than near the fuselage. With drop tanks, the fighter's range is said to be "equal to that of long-range fighters."

The P-80 has a wing thirty-eight feet ten and one-half inches in span, is thirty-four feet six inches long and

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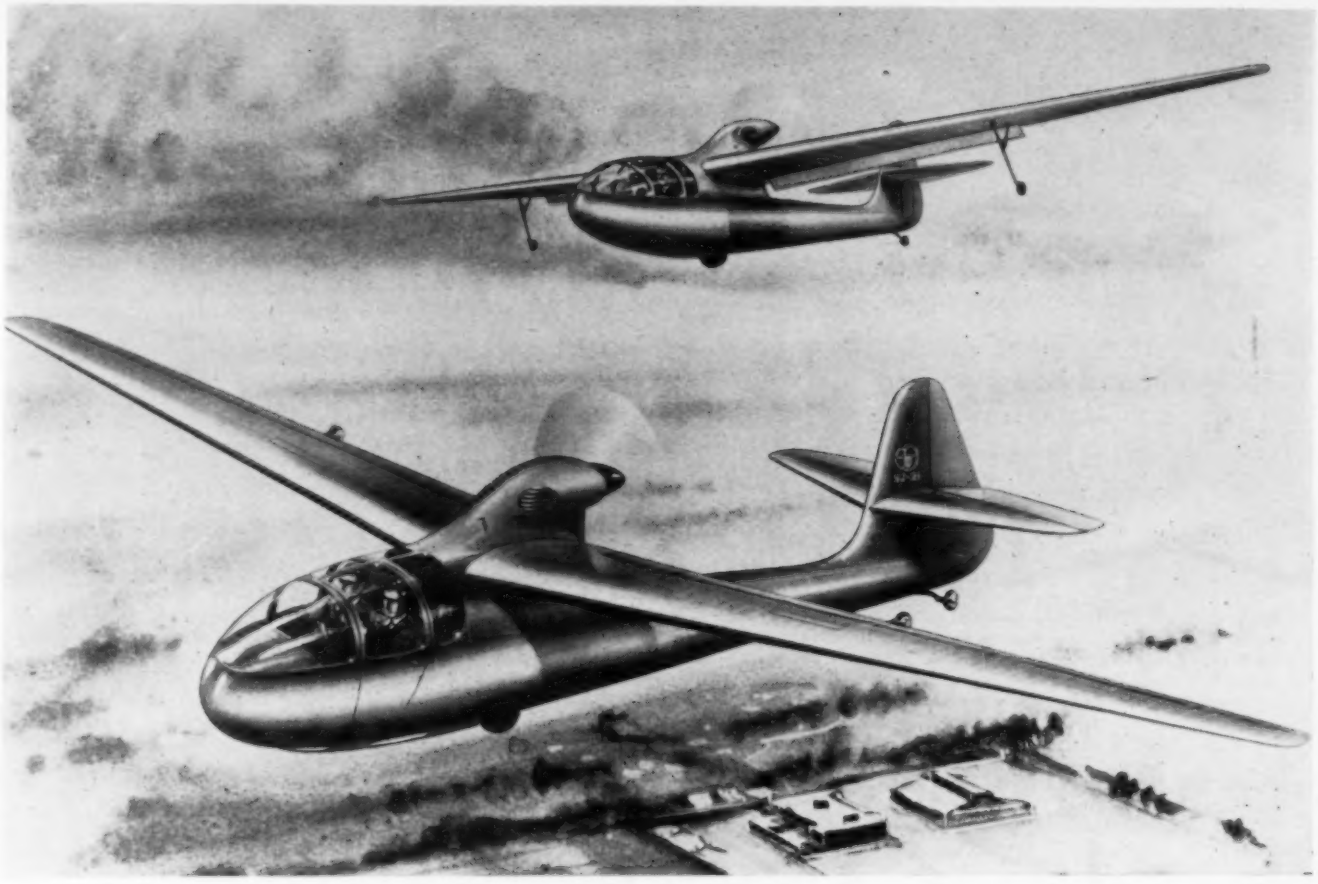


Developed from sailplane designs, newest postwar personal plane offering is Jarvis VJ-21, powered by 65-hp. pusher engine. Note belly wheel and retractable wing wheels.

Powered Sailplane

GLIDERS and sailplanes have been powered with engines before, and powered Cub, Aeronca and Taylorcraft trainers have been converted into gliders by removing their engines. But it remained for Volmer S. Jensen, well-known sailplane designer and pilot, to create a postwar lightplane out of the sailplane's sleek lines.

He has designed a two-place, sixty-five-hp. pusher with sailplane wing and retaining even the single-wheel main landing gear with steel nose skid. Called the VJ-21, it is being prepared for quantity production by the Jarvis Manufacturing Co., of Glendale, California, which hopes to conduct first test flights early in September.

Unusual performance is claimed for the unique craft, the designer's figures including the following:

Cruising speed (70 per cent of power), 110 mph.; top speed, 135 mph.; landing speed, forty mph.; stalling speed, thirty-five mph.; service ceiling, 16,000 ft.; rate of climb (sea level), 700 ft. per min.; cruising range, 400 miles; take-off run to clear fifty-ft. obstacle, 960 ft.; landing run, 150 ft.; landing run over fifty-ft. obstacle, 550 ft.

Four wheels are incorporated into the landing gear. Never before used on a conventional airplane, the main wheel is mounted in the belly two inches in front of the most forward center of gravity to allow the tail wheel to be on the ground and steerable. It has no shock absorber but has a brake drum operated by the pilot. The auxiliary wing wheels, never before used on either airplanes or sailplanes, are half way out toward the wing tip from the center. A long strut, manually retractable, is fully sprung to absorb shock. The wing wheels are small—about the size of conventional tail wheels. They serve only to keep the wings level in taxiing and as an aileron booster in taking off and landing. The airplane, says the designer, can be nosed over slightly on the front skid to shorten the landing run. Ground-looping tendencies have been eliminated by the main wheel installation.

Spoilers and flaps are used on the forty-five-ft. wing, which has an area of 158 sq. ft. and a wing loading of 8.5 lbs. per sq. ft. Overall length of the fuselage is twenty-four feet. The VJ-21's empty weight is 850 lbs., and its gross weight is 1350 lbs.

The pusher installation of the sixty-five-hp. engine features a streamlined power "egg" protruding above the wing, the propeller arc being accommodated by the cutaway fuselage design. Exhaust duct air cooling system is used for the cylinders. The design lends itself to amphibian or seaplane adaptation, Jensen pointed out. A selling price of $2,000 is planned ★ ★ ★

Spartan Aircraft Company's popular prewar Model 12 Executive has been redesigned as a tricycle with higher performance for postwar offering. This mockup in Spartan's Tulsa factory shows new nose wheel, enlarged cabin for five-place comfort as compared to four-place prewar model. Pratt & Whitney 450-hp. Wasp, Jr., same as powered earlier model, is retained. Cruising speed of over 200 mph. and 1,265-mile range are planned for new Executive, first model of which is expected to fly in September. No price has been quoted, but prewar model sold for $22,500 to $25,000. An eight-place twin-engine model is also planned by Spartan.

Private Flying Roundup:

Traylor Quits Surplus; New Planes Delayed

Internal friction drives aviation friend from RFC. . . . Of 37,505 surplus planes, only 6,777 have been sold. . . . OPA suspension of price control benefits industry.

By GEORGE E. HADDAWAY

LIKE the poor, the surplus mess seems always to be with us. Edward L. Traylor has just resigned as assistant director, surplus war aircraft division, RFC, because of internal friction over surplus aircraft disposal policy. Just what effect his resignation will have on surplus sales cannot be evaluated at this time, although it is generally admitted that Traylor was a good man for the post and a capable substitute with experience will be hard to find. Traylor had been making steady progress especially during the past few months formulating sensible policies, getting action and cutting official red tape to a minimum. In spite of official RFC assurance that there will be no change in present policies, the fact remains that dependable aviation background is now lacking in the finance agency.

Meanwhile, the time is ripe for rounding up and analyzing all surplus sales to date. Published herewith is a breakdown of all final sales as of July 15, including only those in which title has passed. It is interesting to note from the accompanying tables that only 6,777 aircraft have been sold out of a total declared surplus of 37,505 planes. Primary trainers have proved most popular with 3,376 going for $3,468,942.70. Next in popularity are the liaison types showing 2,889 sold. Of the heavier types, the Cessna UC-78 has accounted for 249, Lockheed Lodestars for forty-seven and basic trainers for only sixty-eight. One of the last projects Traylor worked on prior to his resignation was a reduction in the price of BT's to $1,500 each.

The complete breakdown follows:

MODEL	Total Number Declared	Total Number Sold
LIAISON		
L-2	1,596	1,381
L-3	1,075	970
L-4	389	354
L-5	63	4
L-6	203	161
L-9	9	9
L-10	1	1
L-12	3	2
GI-80	1	....
GQ-1	1	1
NE-1	12	5
J-4-A	4	....
SR-5-A	1	1
Total	3,358	2,889
Total revenue from sales	$2,388,640.22	
PRIMARY TRAINERS		
PT-13	316	13
PT-15	3	....

MODEL	Total Number Declared	Total Number Sold
PT-16	2	....
PT-17	2,037	364
PT-18	2	....
PT-19	3,583	2,045
PT-20	6	....
PT-22	743	494
PT-23	1,021	15
PT-25	2	....
PT-26	1	....
PT-27	269	79
N2S	271	84
N2T	222	....
NP-1	12	....
NR-1	5	....
N3N	568	281
M-62-A	1	1
PT-10	1	....
PT-14	1	....
UPF-7	22	....
Total	9,088	3,376
Total revenue from sales	$3,468,942.70	
UTILITY CARGO		
UC-43	80	56
UC-61	35	27
UC-64	55	1
UC-70	10	9
UC-71	10	9
UC-72	18	17
UC-77	2	1
UC-80	3	3
UC-81	26	21
UC-85	1	1
UC-86	5	5
UC-88	1	1
UC-94	2	....
UC-101	1	1
UC-102	3	3
UC-103	1	1
GK-1	11	3
GQ-1	1	1
J2F4	1	....

Voyager's Power Upped to 140 hp.

Stinson Division of Consolidated Vultee Aircraft Corporation is expected to announce soon that its four-place Voyager will have a 140-hp. engine instead of the 125-hp. powerplant for which it was developed when unveiled last fall. The price will probably remain the same—approximately $5,000. First demonstrators to reach distributors in September will have the 140-hp. engine, and dealers will begin receiving Voyagers in October, according to latest schedules.

MODEL	Total Number Declared	Total Number Sold
JK-1	1	....
Rearwin—Navy	2	....
SR-10F	2	2
ST-9F	1	1
VKS-7	3	1
Bellanca	1	1
Total	276	165
Total revenue from sales,	$927,824.57	
LIGHT TRANSPORTS		
OA-4C	1	1
OA-14	7	2
XC-35	1	....
UC-36	4	3
UC-40	8	7
C-45	6	....
C-73	1	1
UC-78	2,625	217
JRC-1	15	....
R-2O	3	1
R-3O	1	1
Total	2,672	233
Total revenue from sales	$1,015,365.20	

MODEL	Total Number Declared	Total Number Sold
MEDIUM TRANSPORTS		
C-32	3	1
C-33	1	1
C-34	1	....
C-38	1	....
C-39	1	....
C-41	1	....
C-47	8	1
C-48	3	....
C-49	43	11
C-50	1	....
C-52	1	1
C-53	114	49
C-56	3	....
C-57	3	3
C-59	2	1
C-60	157	34
C-67	13	7
C-76	13	4
C-84	1	....
SM-72	1	....
SM-82	1	....
JRS-1	3	....
RB-1	14	....
R2D-1	1	1
Total	390	114
Total revenue from sales	$5,304,725	
HEAVY TRANSPORTS (2 engines)		
C-46	1	....
HEAVY TRANSPORTS (4 engines)		
C-54	20	....
C-87	6	....
C-108	1	....
Total	27	....
Grand Total	15,812	6,777
Total return from all sales	$13,105,497.69	

RFC SUMMARY REPORT OF SURPLUS WAR AIRCRAFT

(As of July 15, 1945)

Standard Classification	EDUCATIONAL DISTRIBUTION Quantity	Reported Cost	Sales Price	SALES Quantity	Reported Cost	Sales Price	BOOK INVENTORY Probably Saleable Quantity	Reported Cost	Probably Not Saleable Quantity	Reported Cost
AIRPLANES										
Liaison				2869	8,106,730	2,373,136	351	994,790	111	825,353
Utility Cargo				164	2,020,213	924,495	105	2,930,917	4	162,917
							2*	23,002*		
Light Transports	1	33,765	150	278	9,584,531	2,430,558	2,245	75,809,214	127	4,482,740
Medium Transports				122	14,768,969	4,946,314	133	36,932,720	5	792,770
Heavy Transports							8	2,586,211		
Primary Trainers	1	9,728	100	3632	39,199,607	3,979,675	4,979	53,307,332	305	3,329,487
							11*	75,681*		
Sub-Total	2	43,493	250	7065	73,680,050	14,654,178	7,821	172,561,184	552	9,593,267
							13*	98,683*		
Observation									136	5,410,353
Reconnaissance				1	112,649	18,000			49	9,254,520
Basic Trainers				72	1,796,698	262,353			8,013	199,823,130
Advanced Trainers				30	1,777,627	145,976			3,713	173,800,664
Fighters									2,435	201,127,111
Light Bombers	1	55,071	100	3	170,346	8,700			1,185	104,637,384
Medium Bombers				10	1,395,116	196,000			880	157,833,529
Patrol Bombers									256	72,945,630
Heavy Bombers	2	683,978	700	1	339,392	25,000			1,725	574,355,331
Sub-Total	3	739,049	800	117	5,591,828	656,029			18,392	1,499,187,652
Airplanes	5	782,542	1050	7182	79,271,878	15,310,207	7,821	172,561,184	18,944	1,508,780,919
							13*	98,683*		
3100 Aerial Targets				5	26,000	5,492			7	115,172
3210 Autogiros									5	666,003
3400 Free Balloons									2	500
3500 Barrage Balloons				20	56,190	1,256			331	747,770
3600 Gliders	1	3,738	50	445	1,177,939	185,558	651	4,197,344		
Total	6	786,280	1100	7652	80,532,007	15,502,513	8,472	176,758,528	19,289	1,510,310,364
							13*	98,683*		

*RFC-owned.

TAYLORCRAFT'S NEW OFFICIALS are establishing new production, distribution and service lineup for early activity in postwar sales. Top row, left to right, are Nash Russ, president; F. T. Pendell chief engineer; George Webster, works manager; O. M. Bell, sales manager. Bottom row, left to right, are W. W. Third, secretary-treasurer; A. Sclater Ellis, general manager of manufacturing; J. F. Masterson, public relations director; Macdonald Goodwin, assistant sales manager; George Bennett, personnel director. Russ is also president of Detroit Aircraft Corp., pioneer aviation firm which once controlled Lockheed and Ryan and built world's first metal-clad airship. Pendell formerly specialized in quality control with Bell, Chance-Vought and Curtiss.

Beech-Cessna Merger Dropped

"Unexpected complications" in war production by both companies were cited as the reason why officers of both Beech Aircraft Corporation and Cessna Aircraft Company discontinued negotiations for the proposed merger of Beech and Cessna. No further moves to merge the firms are contemplated for the immediate future, but continued close co-operation between them is expected to result advantageously for postwar development.

OPA Ceilings Suspended

Lightplane manufacturers have obtained a suspension of OPA price controls over airplanes and most aircraft parts. While control was not terminated, and may be reinstated, its suspension paves the way for more optimistic planning by the manufacturers. The old price ceilings would have handicapped reopening and development of the market for new airplanes.

If, as expected, the general level of prices does not show too great an increase, airplanes and parts will be exempted from price control. However, OPA Administrator Chester Bowles warned that controls will be reinstated promptly if prices increase in an inflationary manner. He explained the suspension is in line with OPA policy of suspending or ending price control over commodities as soon as inflationary dangers are over in any commodity field. The potential supply of airplanes and the aircraft parts affected by the suspension "far exceeds the demand." Aircraft parts that will remain under price control include airplane tires and tubes.

Piper Delayed Sixty Days

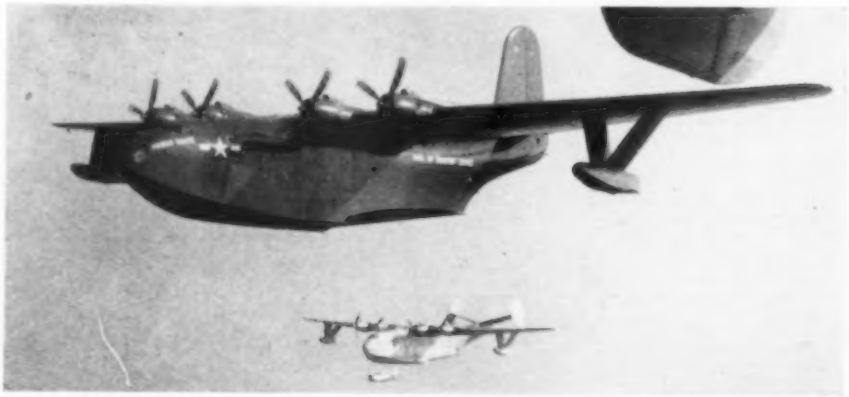
War production has delayed Piper Aircraft Company's production of civilian models. Operating under increased Army demands for its liaison models, Piper reached its military production peak in July. Early deliveries of J3 civilian trainers, expected in late July, were postponed until after Army quotas could be met, and are expected now during September. That means Piper's delay amounts to about sixty days. The J3 deluxe trainer will sell for $2,010, the standard J3 will sell for $1,885, and the new J5 Cruiser, with 100 hp. instead of seventy-five hp. of prewar days, will sell for about $2,905.

Taylorcraft in Production

Taylorcraft Aviation Corporation began preparations for production of its sixty-five-hp. BC12 and its Model 15 four-place family plane during July. The latter will be offered in two versions, one with 125-hp. engine for about $3,550, and another with 140 horsepower for about $3,995. The two-place BC12 will have several refinements, including a new instrument panel and control wheels, an extra six-gallon gas tank and a one-piece plexiglass windshield. It will sell for about $2,295, according to latest company figures. Quantity production of this model is expected to be reached during September.

Harlow Buys Interstate

Harlow Aircraft Company of Alhambra, Calif., has completed negotiations to purchase all of Interstate Aircraft and Engineering Corporation's engineering drawings, production tooling and spare parts for Interstate's complete line of lightplanes, which include the sixty-five- and ninety-hp. Cadet, the L-6, and the side-by-side S-3. Harlow expects to begin production of the Cadet series "at the earliest possible date." More than 700 Interstates were manufactured during the last few years. Harlow's present line of personal planes will also be manufactured. ★ ★ ★



DISASTER OVERTOOK HAWAII MARS, world's largest seaplane, when hull was damaged in emergency landing during test flight and 87½-ton Martin boat sank in Chesapeake Bay. It was first of 20 Mars transports being built for Navy. Here's Hawaii Mars on first flight shortly before accident, with original twin-ruddered model in background. —(Glenn L. Martin Photo.)

". . . to take off behind a Cub in a Corsair, follow him around the field and land behind him would be a greater accomplishment than picking a handkerchief off the ground with my wing-tip."

—Illustrated by Lt. Joe James, USNR.

CONFESSIONS *of a Flight Instructor*

PART X

By A. H. KNOUFF
Lt. A-V (T), USNR*

MANY of the students who learned to fly during the last four or five years in military or CPT-WTS courses got the idea that a traffic pattern was a rigid affair that must be entered at a certain altitude, at exactly a 45-degree angle on a certain side of the field. Those who trained in the Army-dominated schools think the pattern must be a perfect rectangle, while those who learned under the supervision of the Navy are convinced that an oval flight path is the only way to fly around a field. We have not had time to explain to our students why we told them to make their patterns and approaches a certain way. Some of them grew up to be instructors, without learning the reasons.

Most of their flying experience has been gained at fields restricted to one general type of aircraft. A visitor who did not conform to the local dogma was an ignorant, unwelcome nuisance. The visitor, on the other hand, might consider the local pilots a bunch of screw balls.

The other day I was checking out some Army pilots in UC-78's. The first one I had ridden with was shooting some more landing solo while I was riding with No. 2, when I heard the tower tell an FM-2 (Navy's Wildcat) he was No. 3 to land. I did not have to be a Dunninger to guess what the pilot of the FM was thinking. I got out after that hop and had just entered my office when the FM pilot burst in declaring indignantly, "These Army pilots fly those JRC's (Navy designation of the UC-78) like they were in a B-24."

"You're right," I replied, "that is exactly what they were doing. They have been flying B-24's or B-17's for the last two years." The first pilot's approach was much wider than necessary in the Cessna, and the second pilot was correspondingly wider. This was undoubtedly exasperating to the pilot of the Wildcat, which is noted for its maneuverability. I hope he learned an important lesson. You never know who may be flying the other airplane. He may be a student on his first solo. He may be an experienced pilot, wisely making a large pattern to give himself plenty of time to go over his check-off and plan his landing in a strange ship. Or he may be an old-timer making an unusual approach because of some airplane characteristic unknown to you.

You can show off your piloting ability best by holding your position in the pattern and giving the other fellow the benefit of the doubt. Personally, I feel that to take off behind a Cub in a Corsair, follow him around the field and land behind him would be a greater accomplishment than picking a handkerchief off the ground with my wing-tip.

Why Follow Traffic Patterns?

The rectangular pattern is advantageous around large landing fields. The downwind leg can be as far out as is necessary to observe the whole field, the activity on the ground and in the air around it. The downwind or base legs may be varied in length and direction to meet traffic conditions. The base leg affords an opportunity to estimate the strength of the wind (by the amount of crab required to parallel the edge of the field) and may be modified to meet emergencies or correct errors of earlier planning.

Principles of teaching the rectangular pattern are the same as circling a pylon, or figure-8's around pylons, which we talked about in the June issue. Each turn at the corners of the rectangle is a quarter of the circle, as I pointed out at that time. Applying this to the traffic pattern for take-offs and landings, we start with a straight climb to an altitude at which we can safely turn. Just what this altitude is will depend on the airplane and the airport. Ordinarily, this altitude is considered to be 500 or 600 feet above the ground, but exceptions to this rule

(Continued on page 42)

*Opinions and assertions herein are the author's, and are not to be construed as official or reflecting the views of the Navy Department or the naval services.

Postwar Outlook For Aircraft Instruments

PART III

Commercial adaptations of war-developed instruments will come first, but simplified versions and lower prices are expected ultimately for private fliers.

By ESTHER H. FORBES

AIRLINES and private fliers can look forward to flying with more accuracy, through wider ranges of weather, and in greater safety because of wartime developments in aircraft instruments by the Sperry Gyroscope Company. These improvements result from the company's accelerated pursuit of its primary research in gyro-stabilization and measurement of vibration.

Gyroscopic developments have been concerned with indication of an airplane's attitude and direction in flight and with its automatic control. All these gyroscopic instruments will probably be applicable to commercial aviation within the next year, while simplified versions of them should be available for the private flier within one to five years. Developments in vibration measurement, on the other hand, have been concerned with engine performance and will probably be applicable only to commercial flying in the immediate postwar era.

Successor to Turn-Bank

For indicating an airplane's motion around its roll and pitch axes, Sperry has developed a new gyro attitude indicator, which it believes will eventually replace both the turn and bank indicator and the gyro horizon. The instrument consists of a stabilized sphere mounted without limit stops so that it has complete freedom of rotation. Marked off to produce pattern rather than linear indications, it gives the pilot a continuous picture of the airplane's attitude throughout all maneuvers.

The upper half of the sphere is dark in color, while the lower half is light. In level flight they are divided by a fixed horizontal reference line on the case, which is dotted alternately light and dark and which has a circular bull's eye in the center. During a climb the white half seems to travel under the line until, in a ninety-degree climb, only the white section is visible. Likewise, during a dive the black half seems to travel under the line until, in a ninety-degree dive, only the black section is visible. Whether the plane is in normal flight or inverted flight, the reference line is always in the light area during a climb and in the dark area during a dive, so that the pilot can get an almost instantaneous picture of his position when in clouds or fog.

Vertically, the sphere is bisected by a meridian line which passes through both polar positions. Bank of the airplane is indicated by the angle between this meridian line and a vertical index on the case. In right banks the horizontal and vertical references on the case rotate clockwise around the sphere, and in left banks they rotate counterclockwise. This holds true whether the pattern is for level flight or climb or dive.

In all maneuvers, of course, the gyro-stabilized sphere itself does not rotate. Instead, the plane and instrument case rotate around the gyro, much as the earth rotates around the sun.

Gyro Attitude Indicator

The outstanding feature of the gyro attitude indicator is its ability to give full 360-degree indication about the roll and pitch axes of the airplane. Its predecessor, the gyro-horizon, required "stops" to prevent the gyro assembly from rotating freely, so that during a steep climb, dive or bank the gyro "tumbled" and became inoperative until it was caged or reset itself after about fifteen minutes of level flight. The gyro attitude indicator requires no such caging device or other adjustments. Thus, with its aid a pilot can execute loops, rolls, Immelmans or any other maneuver or combination of maneuvers in clouds, at night or under the hood with full knowledge of the attitude of the plane at all times. Because of the simple nature of the pattern indications, he can recover from any flight attitude, however hazardous, with speed and accuracy.

The current model of the gyro attitude indicator is electrically driven, weighs four and one-fourth pounds, and measures four and seven-sixteeths inches in diameter. However, Sperry has also developed two smaller models, one electrically driven and the other air driven, to meet the standard AN specification of a three and one-eighth-inch panel cut-out diameter for small instruments. Both of these are about to go into production and should be ready for the postwar market.

More intricate, the electrically-driven instrument is more reliable at low pressures and low temperatures and is also considerably more expensive. It will, therefore, probably be used almost exclusively by the air forces and the airlines, which fly at high altitudes and can afford expensive instruments.

The air-driven model, on the other hand, may be expected to find wide use on private planes, which do not fly at high enough altitudes to affect the operation of the gyro substantially. It operates on the same principle as the electrically-driven mechanism and, like it, gives the pilot a continuous complete picture of the plane's attitude in a glance. Yet, with all its advantages over previous types of attitude indicators, it is expected to sell for

about the price of a good prewar turn and bank indicator. Air filters have been so improved that they will need to be replaced only every 100 hours, and the whole instrument will need to be overhauled only every 500 hours.

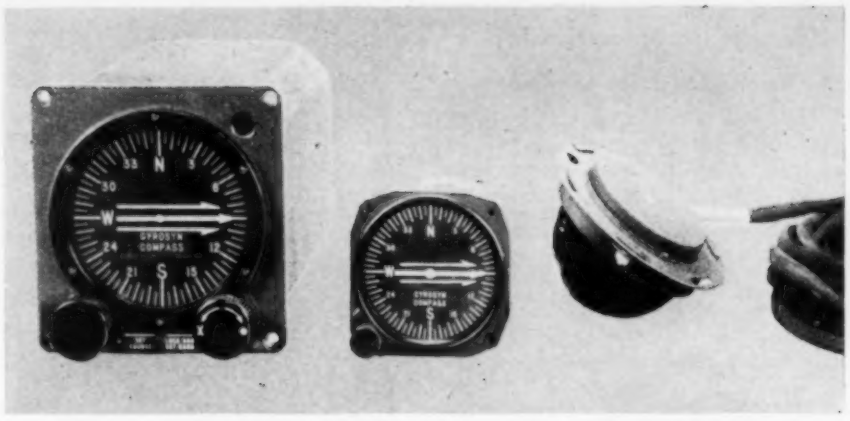
Lower Price for Compass

In the gyrosyn compass Sperry has produced a device which is as important as a navigational instrument as the gyro attitude indicator is as a flight instrument. Fundamentally, it is a directional gyro, synchronized with the earth's magnetic meridian by means of a flux valve, which provides a stable and accurate directional indication at all times and does not require resetting.

In principle the gyrosyn compass is much like Pioneer's gyro flux gate compass. Both are North-seeking in the same sense that a magnetic compass is, but do not have the disadvantages of northerly turning error, oscillation or swinging. A flux valve consisting of a pendulously mounted pick-up coil, detects the direction of the lines of force of the earth's magnetic field. This information is transmitted electrically to a processing device incorporated in a directional gyro unit, which is geared to the pointer of the compass. The dial is of the compass rose type and, in addition to the direction indicating pointer, has a course indicator. This can be set to any desired heading so that, to steer the airplane, the pilot need only align the direction indicator with the course indicator. Indications can also be transmitted to a number of compass repeaters in other parts of the plane.

One of the main differences between the Sperry and the Pioneer compasses is that a directional gyro is used to stabilize the gyrosyn compass, whereas a vertical gyro is used in the flux gate compass. This means that with the gyrosyn compass, if the flux valve should not function properly, it can be disconnected and the directional gyro used to give direction readings on the compass dial. Another difference is that the flux valve of the gyrosyn compass is so small and light that it can be installed in the extreme tip of the wing, where there are fewer local magnetic disturbances than in any other part of the plane.

Like the gyro attitude indicator, the present gyrosyn compass is electrically driven and measures four and seven-sixteenths inches in diameter. Its weight is about eight pounds. As with the gyro attitude indicator, however, a smaller air-driven model is now under development to meet the standard AN specification and, more important, to meet the budget of the private flier.



Gyrosyn Compass, with remote indicating repeater in center and flux valve, usually installed near wingtip.

Gyrosyn compasses now cost many hundreds of dollars. The air-driven instrument, it is hoped, will approach the price of a good magnetic compass and will be available for the private plane within a year. A small, moderately priced electrically-driven gyrosyn should also be available within a year for airline use.

Precision Auto Pilot

Development of a new precision gyropilot, designated the A-12, has probably been Sperry's biggest single engineering job of the war. Smaller, lighter and less complex than the A-5, the A-12 was designed to give more precise automatic control, which is becoming increasingly necessary to meet the problems of increased air traffic and to facilitate automatic landings in instrument weather.

One of the chief reasons that the A-12 is able to achieve greater precision of control is that it incorporates an electriconic signal system, which enables it to take advantage of the accuracy attained by new horizontal and vertical gyroscopic references. Not only does the system sense the slightest deviation of the airplane from these references but it also predicts the exact amount of control surface effort required to hold the plane in precise agreement with them. To utilize this no-lag signal system, faster, more powerful servo mechanisms have been developed which control the aircraft in a dead-beat manner in the roughest air, automatically applying control corrections before the airplane's attitude changes appreciably.

This precision of control should make the A-12 a particularly desirable instrument for the airlines since it will greatly increase the comfort of the passengers by eliminating the usual yawing and wallowing of the plane in turbulent air. Actually, passengers will hardly be aware of rough air conditions unless they can see the alert but deliberate movements of the control wheel and rudder pedals.

One of the features of the A-12 is that it provides co-ordinated turn control at all speeds. When the turn knob is moved to the right or left, a rudder and aileron signal is sent to the servos through an amplifier circuit in correct amounts to provide a co-ordinated turn, and the rate of turn is compensated for air speed by a sideslip sensitive system in the amplifier. Previous automatic pilots had been designed to co-ordinate turn and bank for one speed only. At higher or lower speeds, therefore, the plane necessarily slipped or skidded to some extent. With the A-12, however, the plane never slips or skids, thus making for smoother flight and more efficient operation.

The A-12 also provides more accurate altitude control. An altitude control mechanism is contained within the amplifier which maintains the airplane in still air, within twenty feet of the desired pressure altitude both in straight flight and during turns. When flying through vertical air currents, the rate of altitude recovery is limited to prevent too steep climbs or glides.

Another feature of the A-12 is the use of the gyrosyn compass as the basic element for control about the yaw axis. Since the gyrosyn compass gives a steady indication in turbulent air and does not require resetting, it enables the A-12 to fly on a constant magnetic heading.

The advanced principle of automatic control incorporated in the A-12 permits the use of several new accessories in addition to a trim tab control, automatic throttle control, remote indicators and radio navigation aids. Provisions have been made in the amplifier, for example, to enable an automatic approach system to be incorporated at any time without any changes being made to the existing system. Before long, it may be ex-

pected, there will be further provisions for complete automatic landings.

Small Model for Civilians

The A-12 still being in the flight test stage, the type of instrument panel indication for it has not yet been determined. Several types of remote indication are now under consideration. One interesting possibility is a flight repeater which would combine roll, pitch and directional indications on one dial. A miniature airplane, like that on the gyro horizon, would move to show bank, a line would move to show climb and dive, and a card at the top would move to show direction.

With all its improvements over the A-5, the A-12 is smaller, lighter and easier to service. For example, though its vertical gyro is the same size as that on the A-5, the entire gyro mechanism is much smaller and less complex, and weighs only about one-fifth as much. Similarly, the gyrosyn compass weighs about one-third as much as the azimuth gyro on the A-5. The total weight of the complete pilot depends, of course, on the servo requirements. For most airplanes up to 35,000 pounds (such as the DC-3) this total weight is approximately seventy-five pounds, while for most airplanes up to 100,000 pounds (such as the DC-6) it is approximately 100 pounds. This compares with weights averaging from 150 pounds to 175 pounds for the A-5.

Though less expensive than the A-5, the A-12 will still cost several thousands of dollars and will therefore be applicable only to military and commercial aviation. For the private flier Sperry engineers are now at work designing a smaller, simpler and cheaper instrument, comparable to the air-driven attitude gyro and gyrosyn compass, using the experience gained during their wartime research on the A-5 and A-12.

Elimination of Detonation

In addition to new gyroscopic flight instruments, Sperry has also developed during the war its first engine instrument, the detonation indicator. Detonation, or knocking, has long been recognized not only as one of the three main factors limiting engine performance but also as a destructive force which can burn out the engine's pistons and valves within a short time, thus causing engine failure. Until recently, however, it had been impossible to detect and measure detonation accurately. Now, with the development of detonation indicating systems by Sperry, it is possible for the pilot to check detonation in its early stages before the engine is damaged.

Detonation Indicator

Detonation is a localized high pressure area caused by uneven burning of the mixture of fuel and air. This creates a shock wave which produces vibration in the cylinders. To detect and measure detonation, therefore, Sperry adapted the electric vibration pick-ups, which it had developed in conjunction with the Massachusetts Institute of Technology, for installation on the engine cylinder heads. As soon as detonation occurs in a cylinder, the pick-up unit on that cylinder head produces a signal which is amplified and used to operate a flashing light indication on the instrument panel.

Originally designed as a safety device to help the pilot safeguard the operation of high-powered aircraft engines, the detonation indicator can also be used to determine how lean a mixture of fuel and air is possible in any given flight conditions. Normally pilots use a richer mixture than is necessary in order to prevent detonation and the resulting damaging effects to the engine. With a detonation indicator, however, a pilot can experiment with the mixture, pushing the mixture control back until the light flashes or until the engine becomes unstable or the cylinder head temperatures rise too close to the manufacturer's maximum. He can then adjust the fuel mixture control so as to use just enough fuel for the engine to operate safely at the desired horsepower.

Following this procedure, Sperry test pilots have found they can effect a reduction of some 10 to 15 per cent in gasoline consumption on long-range flights. Such a reduction would be of tremendous value to commercial airlines, for in addition to saving them the cost of the gasoline not used it would enable them to increase the payload. If, for example, on a flight normally requiring 3,000 gallons of gasoline, 300 gallons could be saved, the payload could be increased by 1,800 pounds. Since a detector for a large transport weighs about 120 pounds, this would mean a net gain of 1,680 pounds. With the value of a pound saved calculated at $200 in the life of a transport, the total gain in cargo or passengers carried would be about $336,000.

While starting production on the detonation indicator, Sperry is already working on another more complex device incorporating the indicator. This is an automatic mixture control which would regulate the mixture of fuel and air to produce efficient results.

Ultimately the company hopes to design a complete automatic power control. In addition to determining the best fuel-air ratio, this would control a number of other variables affecting the development of horsepower, such as manifold pressure, rpm., cylinder head temperature, propeller pitch and propeller speed.

Although used primarily as the basis for engine instrumentation, the detonation indicator has also been adapted for laboratory test purposes to rate fuels. This version of the device has a complete oscilloscope for examining vibration and is called a knockometer.

Unique among instrument manufacturers, Sperry has always conducted all its research and engineering development at its own expense. During the war, however, it has worked closely with the Army and the Navy in meeting their needs. For example, when the Navy began to use dive bombers extensively and badly needed a reliable attitude indicator for them, Sperry rushed development of the attitude gyro with the result that it was in production for the Navy a year earlier than it would have been normally. It is because of such accomplishments during wartime that both the airlines and private fliers may look forward to flying with greatly increased safety, both in contact and instrument weather, when peace comes. ★ ★ ★

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FLIGHT INSTRUCTOR

(Continued from page 37)

are numerous. On the short south runway at Cheyenne, we eased into our turn immediately after becoming airborne because climbing straight ahead we would clear the houses by only a narrow margin, while the terrain to our left made a forced landing definitely feasible. However, it should be remembered that we were choosing the lesser of two risks. If we had been flying heavier planes, in which the possibility of completing a forced landing out of the turn was less, or more powerful ones which could attain a better altitude, turning so low would have been foolhardy. Before any such deviation from standard practice, stop and think whether it is necessary or merely an excuse to show-off.

Our first concern is keeping the climb straight after take-off. If the student has been watching the edge of the runway to keep his ground-run straight, and fails to look out both sides of the airplane, he is liable to let the airplane drift or turn toward the side opposite the one he is watching. This is due to the optical illusion of perspective. An object appears to become smaller as it gets farther away. This makes both sides of the runway appear to move in under the airplane, and if the student is looking out one side only, he will move over to keep the runway in sight—or any other object being used as a guide.

The correction is to remind him to look out both sides of the plane, and to use a series of landmarks as guides. To prove to the student whether or not he is climbing straight, have him try to look at his tail on both sides. If he can see the runway, he should be exactly in line with it. In some airplanes he will not be able to see the runway if he has made a straight upwind take-off, and you should explain to him accordingly. Besides being a demonstration of good flying technique, a straight climb after take-off enables the pilots of planes taking off behind you to plan their flight paths so as to avoid the danger of colliding with you. Of course, the practice of looking back at the runway to see if you are climbing straight serves the additional purpose of watching out for other airplanes. If you are taking off behind a plane that is slower than yours, it is more important to keep him in sight than it is to keep your flight paths straight. Teach your students to plan and control their flight paths accordingly. While watching out for the aircraft ahead, remind them that they must also watch out for those which may be behind.

Before making his first turn, see that he goes through the routine that should be a habit before every turn. Look out and behind to the right as far as he can, glance at the instrument, and look out to the left and back as far as he can before turning to the left. The established pattern at some schools required that this be a level turn, while at others a climbing turn was required. Originally, the choice was probably due to differences in the terrain at the schools involved, but many instructors went to other schools insisting blindly that the way they had been taught was the only correct way. Whether the initial turn after take-off is level or climbing, the important thing to get across to your students is control of speed, altitude and direction.

Using the diagram we drew while talking about figure 8's and flying around a point, we see that this turn is quadrant No. 1 of the circle, that the bank will be steepest at the start of the turn. Our bank should be continuously reduced so that we finish it with the wings level and the nose crabbed into the wind to make our flight path ninety degrees to the direction of our climb. For instruction purposes, it is a good idea to insist on a ninety-degree turn. If you are going cross-country on a heading that is less than ninety degrees from your take-off heading, it is not really necessary to make a complete quarter turn, but it should be just as carefully planned to roll out exactly on the direction you want.

This is not the place to talk about the danger of downwind turns except to call attention to the fact that during this first turn after take-off the danger is perhaps greater than at any other time. We are close to the ground, not much room to recover from an unexpected spin. Being so close to the ground, drift will be more obvious and we are likely to be fooled into thinking we are slipping and putting ourselves into a dangerous skid trying to correct for it. If we hit a bump and try to pick up the inside wing with the aileron, it may be the last straw.

Another greatly misunderstood item in traffic patterns is the forty-five-degree angle leaving and entering. Most schools established rather rigid practices on this. Some required departure or return at a specific point in relation to the direction of take-off while others actually set up pylons to mark the geographical point to join or leave the field traffic. In each case the selection was made for some logical reason, such as convenience to the practice areas, or to avoid flying over areas on the ground because of annoyance, interference with ground activities, or actual danger.

Many pilots and some schools thought that forty-five degrees was the *minimum* angle at which traffic should be entered, while others thought it was a maximum. I have seen pilots —not always students—fly head-on toward aircraft circling a field until they arrived at the point established for entering traffic, then execute a 180 (crossing the path of several aircraft in the process)—thinking all the time that they were complying with the rules.

Many pilots do not seem to understand the reasoning behind the forty-five-degree entrance to traffic. It is simply that two aircraft going the same direction have more time to avoid each other than the same two aircraft approaching head-on. Since an approaching aircraft cannot be going the same direction as aircraft already in the traffic circle, the best he can do is fly in as nearly the same direction as possible. Following this reasoning, the approach angle should be less than forty-five degrees to the direction of traffic.

Keep An Open Mind

There may be some difference of opinion how far from the field the forty-five-degree rule should apply, and of judgment of a forty-five-degree

(Continued on page 70)

"Whenever I approach or pass near an airport, I fly so I can see the entire field on the left of the nose of the airplane."

MODERN AIRPORTS

August, 1945

Volume II Number 6

Purdue University Airport

In keeping with aviation development and expansion, Purdue University at Lafayette, Ind., will expand its elaborate airport and aviation engineering facilities soon. Proposed expansion includes new concrete 200-ft. by 4,500-ft. northeast-southwest runway, a new concrete 150-ft. by 4,500-ft. northwest-southeast runway, and new 150-ft. by 4,000-ft. north-south and east-west runways. Above are present airport buildings.

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Airport Planning for Private Flying

PART III

Turfing

A dense turf in climates and under conditions where such may be accomplished is one of the most important items of airport development and, from a straight dollars and cents viewpoint, is one of the best investments to be made. A good turf will eliminate erosion from wind and water and will in many cases provide the most satisfactory cover for airport surfaces even for those areas where intensive use may be expected. Turf will eliminate the dust which is so objectionable and damaging to engine and working parts of the airplane. Observation of airports in operation will substantiate the fact that the private plane pilot prefers a good turf to pavement, except during periods when the turf may be too soft to support operations.

It is felt that with improved grading and drainage design the turfed landing strip will render a greater service than has been experienced in the past and will provide for many airports the more desirable and cheaper airport surface. Even on those airports where the volume and weight of traffic will require paved runways and taxiways, the intermediate areas must still be protected from erosion and turfing will be the most satisfactory solution.

Many types of grasses are available for turfing. Principal among these may be mentioned Bermuda, Buffalo Grass, Blue Grama, Carpet Grass, etc., The selection of the best type for a particular site must be based upon local knowledge and observation of those types which are native to the area and will thrive without irrigation. For areas supporting traffic a tough, wear-resisting turf must be developed while for areas intermediate to those used for operations, the principal concern and objective is to prevent erosion and dust. The advice and assistance of the county agricultural agent should be sought.

The planting should be accomplished in the most favorable season of the year, the seed bed should be carefully prepared, good seed or healthy sprigs used, and in the majority of cases the use of fertilizer to promote rapid growth will be well worth the cost. Mowing is often neglected and in many cases the failure of turfing efforts may be attributed to this neglect. Frequent mowing of the grass will promote spreading and will retard or kill the weeds and volunteer growth which might otherwise choke out the turf grasses. Light cuttings should be left on the ground to develop a mulch and mowing should never be neglected to the extent that the cuttings will be heavy enough to burn or kill the tender growth. Occasional application of fertilizer should also be considered and provided for in operating funds.

Soil Stabilization

Stabilization of turfed areas may also be accomplished to increase the utility of the field during wet periods. The use of shell, iron ore, crushed stone, etc., as stabilizing materials will, in many cases, have no harmful effect upon the turf and will greatly increase the supporting capacity of the soil. In some areas the use of shell and iron ore have actually improved the turf and appear to be conducive to the growth of Bermuda. Applications of the materials may be rolled into the surface or incorporated in the top layer of the soil during tilling operations.

In the arid areas the establishment of turf is a difficult and in some cases an almost impossible task and some other means of combating dust and erosion must be developed. Covering the field areas with a coarse granular material which will not dust or wash and mulching with hay have been used in arid areas with satisfactory results. The hay mulch prevents erosion and at the same time permits the growth of native grasses to develop through the mulch. In other cases the soils have been stabilized with admixtures of asphalt, cement, resin, or other materials which will produce a firm surface and will not erode. The use of the admixtures will, in general, be rather expensive and for this reason the areas so stabilized will likely be limited to those actually supporting operations.

Paving

Some of the more important private flying airports may be subjected to volume and weight of traffic which may not be accommodated satisfactorily on the turf strips, or the character of the soils or climatic conditions may require the construction of paved runways and taxiways to provide a satisfactory facility. Aside from the wheel loads involved, airport paving will closely follow highway practices. Bases of gravel, iron ore, shell, crushed stone, caliche, etc., and bases of soils stabilized with asphalt, cement, resin, etc., probably covered with bituminous surfaces as well as concrete pavement, will be the usual types of runway and taxiway paving. For the private flying airports, it is probable that for the Class I airports, gross loads of approximately 10,000 pounds and for the Class II, gross loads of 20,000 pounds, will cover the anticipated plane designs.

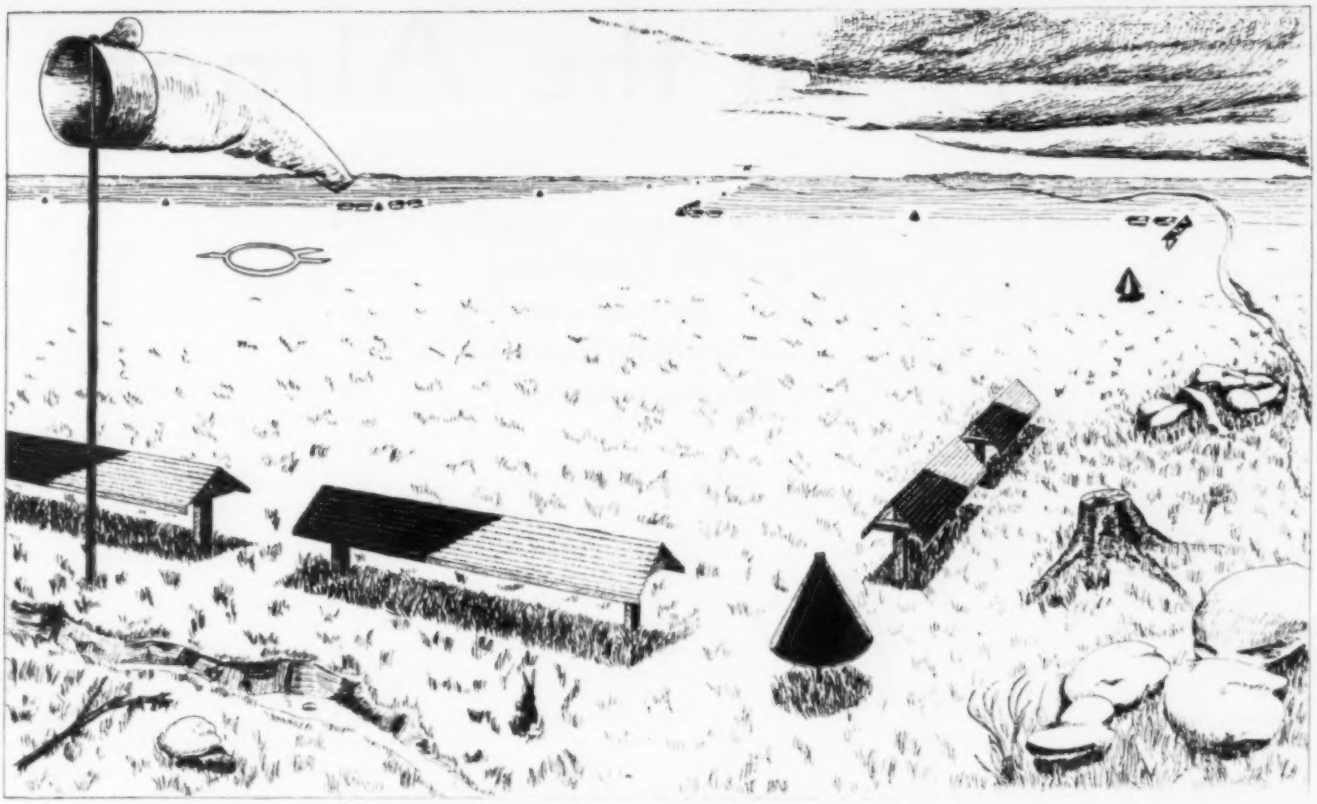
In many cases the airport paving program may be handled as stage construction to advantage thus affecting a saving in the original construction and perhaps avoiding increase in the overall cost of the final development. It may not be desirable or necessary to pave the entire system of taxiways and runways at one time. The construction of one paved runway with connecting taxiways will provide for a great increase in the utility of the development and may satisfactorily provide for occasional heavy planes and wet weather operation. The utility of a single paved runway is considerably greater than the windrose might indicate due to the fact that the larger type airplane may be handled with appreciable cross wind and the light airplanes with skilled pilots may operate satisfactorily under light cross winds. Improved designs of private planes will also provide better cross wind operation characteristics.

Local highway practices should be studied, the state highway and county engineers and the CAA should be consulted. The experience of the city and the equipment available for construction and maintenance should also be considered. For private flying, it is felt that the immediate need is a system of usable turf fields and in general the paving of runways may be deferred until the traffic has developed to a point where such expenditures are justified.

Marking

In the case of small airports with turfed landing strips instead of runways, it is highly desirable to install day marking devices in order that the airport may be recognized from the air and that the areas which are safe

The general aspect of airport planning, site selection, layout, grading, and drainage design have been discussed in preceding issues. Following the sequence of construction, this article will discuss the further improvement of the airport for private flying, in the form of turfing, stabilizing, paving, marking, and lighting.



Simple marking devices for small airports are illustrated by this CAA sketch illustrating markers for which easy-to-follow plans and instructions are available from CAA. Wood may be substituted for metal, which is shown above, and inverted bushel baskets or halves of oil drums may be used instead of the cones. Boundary markers are spaced at 300-ft. intervals along usable areas, and double standards at all corners.

for landing and take-off may be identified. A standard method of day marking is suggested by the Civil Aeronautics Administration and consists of boundary marker cones, corner markers, and a wind sock. The accompanying drawings illustrate the general arrangement of the units and details of the boundary and corner markers. Wood construction may be substituted for the metal corner markers and inverted bushel baskets or halves of oil drums have been substituted for the cone type boundary markers by various operators.

The boundary markers should be spaced at 300 feet intervals along the boundary of the usable areas and double panels should be installed at all corners. All areas within the markers should be safe for operation of aircraft and in event that unsafe conditions develop within the area such hazards must be outlined with red flags to warn the pilot.

The wind sock should be mounted in a conspicuous position where it will give a true indication of wind conditions and will not be affected by eddies or currents around adjacent objects. It should be on a standard at least 18 feet above the ground.

Lighting

The advisability or necessity for lighting private flying airports may be questioned at the present time; however, it is evident that as traffic increases and greater use is made of the airplane, there will be a tendency toward stretching the flying hours beyond the daylight hours, especially in view of the favorable air conditions usually obtaining in the early morning and after sun-down. Operations before sun-up and after sun-down will necessitate the installation of field lighting systems of some sort. For such purposes there is now being developed a simple and inexpensive method of airport lighting. Such a lighting system must include four basic requirements: (1) A rotating beacon which will clearly indicate the existence of the airport to ships in the air; (2) a system of marker lights or floodlights which will outline and identify the limits of the landing strips; (3) an illuminated wind cone or other wind direction indicator which is readily visible from the air, and (4) obstruction lights on all obstructions in the approach and turning zones.

While the majority of the equipment for these cheaper lighting systems is still being developed, it appears that a satisfactory rotating beacon may be produced for about $175. The marker lights for outlining the landing strips may consist either of a circuit of lights spaced at about 300 feet intervals and mounted on pipe standards along the edges of the landing strips or floodlights mounted at the ends of the landing strips or on a portable unit, perhaps combined with reflectors spaced at 300 feet intervals along both sides of the landing strips. The lighting standard, pipe type, is detailed on the attached drawing.

The wind sock may be lighted either internally or by four lights mounted above the sock and so arranged that the entire circle of travel of the wind sock is illuminated.

All obstructions should be lighted with red obstruction lights mounted on their highest point and in such a manner as to truly indicate the height and extent of the obstruction.

All lights are coded by color to indicate their particular function and this color code has been established both nationally and internationally. Therefore, before installing a lighting system, the entire layout should be reviewed by competent authority to assure its compliance with such accepted standards.

(The next and final article of this series will discuss Buildings, Operation, and Management.)

★ ★ ★

Nashville Airpark Opened For Flying

Nashville's new Cornelia Fort Airpark has been officially designated by the Civil Aeronautics Administration, and was opened to the public in July, offering limited services.

The major portion of the field is in excellent shape. The War Production Board has approved sufficient expenditures for necessary hangars and repair shops. The airpark will offer a complete service as soon as construction of the necessary buildings is completed.

Safety on the Airport

Simple warning signs, posted in conspicuous places, will reduce accidents involving passengers and patrons.

By JOHN H. FREDERICK

AN airport is a place fraught with danger for the uninitiated. Sometimes this is forgotten, but in cases where airport operators have been sued for damages, after an accident, courts have generally upheld that an airport operator and his employes must exercise ordinary care as to persons and property thereon or be responsible for damages or injury resulting from the lack of such care. In addition, the courts at times have even held airport operators liable for not keeping their premises free from danger or for failing to anticipate and avoid forseeable risks or dangers.

Airport managers, in self defense, must try to eliminate anything that might cause injury to a customer or visitor. How far they have to go in this regard is of course a question, but it appears only good business for some to do more than they are now doing. For example, one of the most common causes of serious injury to both present and prospective customers, on the ground, is moving plane propellers. Yet at how many airports do we see such signs as the following:

WATCH MOVING PROPELLERS!
KEEP OFF THE RAMP—DANGER FROM MOVING PROPELLERS!

Three accidents have recently come to the writer's attention. All three might have been avoided. None of them was directly the fault or responsibility of the airport managers at the place where they occurred. Perhaps, however, these accidents would not have happened had the ones injured been exposed to a sign or signs warning them of certain dangers. In all three accidents the pilots might have been more careful of their passengers but DANGER signs might even remind pilots as well as passengers.

In accident No. 1, a passenger was seriously injured when he stepped into the path of an idling propeller at an Indiana airport. After a pleasure flight the plane had been taxied to the parking line and the engine left idling while the passenger deplaned. The passenger, taking the most direct path to the waiting room where he was to meet his wife, walked directly into the propeller. The pilot, when this happened, was looking elsewhere and the first he knew of the danger to his passenger was when the propeller struck. The pilot did not caution his passenger to keep clear of the propeller and in this he was negligent as he had left his engine running. Also he was not alert or he would not have diverted his attention while his passenger was deplaning. But the injured passenger in this case was no novice. He had been around airports and had flown with friends many times before. Yet he walked into a propeller. Some sort of a warning might have helped! **We can't afford to hurt or kill our customers or prospects.**

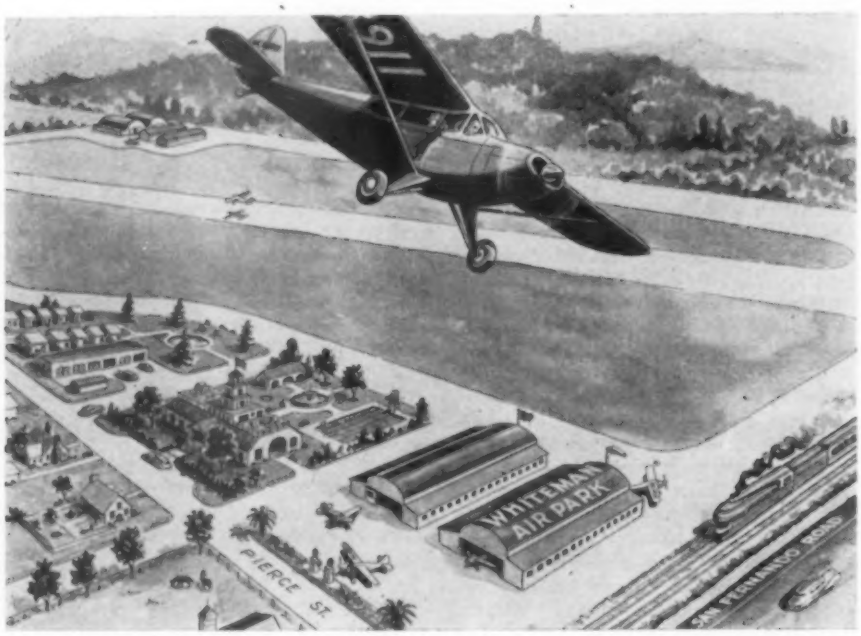
In accident No. 2, a passenger was seriously injured at a Texas airport when he jumped forward over the struts of a plane into the path of its idling propeller. This passenger was a prospect for flight training and had just been given a demonstration flight. The pilot was hardly to blame in this accident because just as he stopped the plane at the flight line, the passenger jumped out and forward over the wing struts before he could be stopped. The pilot saw the passenger jump, turned off his ignition as quickly as possible and shouted, "Watch that prop!" The passenger explained his actions by the statement that there was another boy waiting for a ride and he was "so anxious to tell him that it was his turn that he took the shortest route not thinking of the propeller." Would some sort of a warning sign that this passenger might have seen before starting on his first flight have prevented this accident?

In accident No. 3, which happened at an Illinois airport, a prospect for flight instruction was taken for a demonstration ride in a side-by-side aircraft. After landing, the pilot taxied to the line, applied the parking brakes and allowed the engine to idle. The passenger and pilot talked briefly and then the passenger deplaned, getting out on the left wing. He started to step backward toward the trailing edge but apparently changed his mind and stepped foward over the leading edge and into the idling propeller. While this was taking place the pilot was talking to a third person standing near the right side of the plane. The injured passenger was entirely unfamiliar with airplanes and ordinary caution should have made the pilot supervise the deplaning operation.

A simple sign,

"MOVING PROPELLERS ARE DANGEROUS,"

so placed that anyone would see it at various points about the ramp and waiting room, might have registered and prevented the elimination of a customer while he was still a prospect. **We can't afford to kill or maim our prospects!**



LOCATED INSIDE LOS ANGELES CITY LIMITS, Whiteman Airpark is developing into one of the West Coast's busiest fields for private fliers. It is on San Fernando Road at Pierce Street, 2½ miles southeast of San Fernando and 6½ miles northeast of Lockheed Air Terminal. A 3,200-ft. main runway is served by oil-treated taxiways. Two 100-ft. by 112-ft. hangars are to be built, and plans call for an administration building, a clubhouse and swimming pool. Marvin E. Whiteman is owner-operator.

Air Associates' new catalog is in preparation. This one source for almost every aviation need puts thousands of off-the-shelf and specialty components at your finger tips, saves time, money, headaches!

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AIRPORT MERCHANDISING

By DUDLEY M. STEELE
Manager, Lockheed Air Terminal

INEFFICIENT, extravagant methods used by some airports in their maintenance are sometimes the reason for those same airports being unable to balance their budgets and show black figures in their financial statements. In other words, failure on the part of the maintenance superintendents to take advantage of up-to-date methods of maintenance will result in heavier expenditures for the same item at one airport than at another airport a few hundred miles away.

Indirectly this is chargeable to airport management because they should know and keep abreast of new developments and costs of the various factors involved in airport maintenance. Many times maintenance departments, instead of being concentrated, are scattered widely over the airport. Lack of co-ordination and duplication of effort is the inevitable result. Either of these two factors can cause increased costs. Maintenance departments, consisting as they do of engineering, electrical, painting, plumbing, woodworking departments, etc., should be concentrated in one group. Lockheed Air Terminal has done just this and has consistently cut costs over a period of several years, in spite of constantly aging equipment with increased maintenance costs caused thereby, plus higher labor costs.

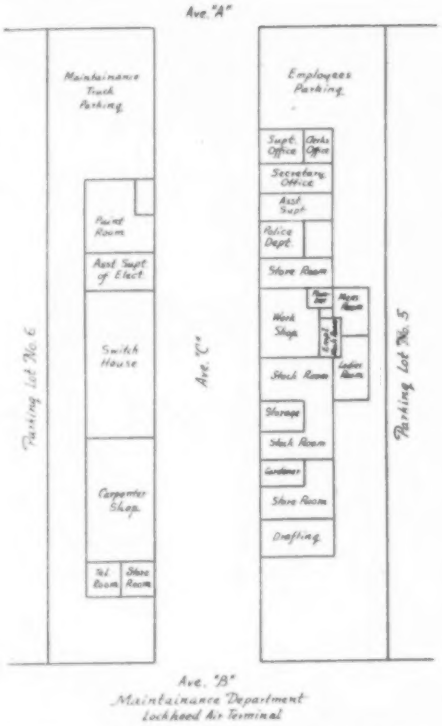
Once a year at Lockheed Air Terminal each department's maintenance is carefully considered and budgeted; every item is discussed and the estimated cost set down. This takes a little time and effort, but it pays big dividends.

KNOW YOUR COSTS—CONTROL YOUR EXPENDITURES! RESULT: EFFICIENCY GUARANTEED!

This is possible by the use of the yearly budget showing estimated costs for all operations to be performed, from the maintenance of runways and contact light system, to the repair of a door lock.

Administration Building

Several years ago a budget was started based upon actual costs of operations, including material and labor, and at that time a standard form was set up to control the actual operations themselves. From that date on the estimated budget was adjusted according to the cost of labor and increase or decrease in cost of material. During the month of November the budget is prepared for the coming year and is placed in effect on January 1. A sample of our budget for the administration building is shown below. The figures are actual budget figures used at this terminal:



Orderly arrangement of maintenance units in centrally-located area at Lockheed Air Terminal increases efficiency and facilitates operations.

The following items are rated 1, 2, and 3, according to their necessity:

ITEM	Rating	Cost
Repairs and replacement to plumbing	1	$ 370.00
Normal replacement of window glass	2	250.00
Paint materials	2	500.00
Repairs to door locks	3	65.00
Repairs to interior doors	3	150.00
Repairs to door closures	3	125.00
Replacement of light globes	1	125.00
Electrical supplies	2	400.00
Caulking materials and roofing paper for minor roof repairs	3	250.00
Replacements to rubber tile floor covering	2	125.00
Repair to electrical signs within lobby	3	50.00
Towels, toilet paper, soap, floor wax	1	840.00
Dumb waiter materials and repairs	2	150.00
Repairs to lobby furniture	3	100.00
Electrical maintenance to all facilities, including switching locations	1	1,400.00
Lumber (hardwoods and shelving material)	1	90.00
Contract cleaning of windows	1	750.00
White sand for cigarette containers	1	40.00
Repairs to window screens	1	60.00
Salt for water softener machine	1	150.00
Freon gas for air conditioning	1	125.00
Estimated Total Expense		$6,115.00

Hangars and Field

A budget is also prepared for all hangars, buildings, field and grounds, which takes in runways, taxiways and warm-up aprons. The items are totaled, as shown in our summary, to form the complete budget which is used to control the various operations of the interdepartments.

SUMMARY

Food and service dept. (contract and material)	$14,300.00
Building expense (contract and material)	20,200.00
Hangar expense (contract and material)	9,700.00
Field and ground expense (contract and material)	42,000.00
Estimated Total	$86,200.00
Maintenance, painting, carpentry, plumbing, electrical, engineering, drafting, clerical, stockroom, supervision labor	$ 89,880.00
Complete janitor maintenance (labor)	46,250.00
Estimated maintenance labor increase due to added runways and facilities	8,200.00
Estimated janitor labor increase	9,300.00
Estimated Total	$153,630.00
Estimated total maintenance costs	$239,830.00

The total of estimated costs is divided in four quarters and immediately after the first of each year a letter is forwarded to the supervisor of each department showing the amount of money that has been approved for expenditures and he is expected to keep within this amount. This is most important, for under no circumstances is he allowed to run over the amount set.

Also, if one particular department should not use all the money allowed for a particular quarter, it is not permitted to use the balance during the next quarter. By this method we are able to obtain many savings.

Our maintenance department is comprised of electrical, plumbing (air conditioning and refrigeration), carpentry, painting, drafting, stockroom, clerical, general maintenance (which includes maintenance mechanics and laborers), PBX (including public address system), janitor and porter (red cap) service.

It is essential to have a supervisor at the head of each interdepartment. This employe should be thoroughly trained in his particular line.

The buildings housing the various

interdepartments are located on either side of one of the secondary streets on the terminal. This one thing has done more to effect perfect coordination and definitely reduce costs through less mileage on the trucks, reduction in telephone service, and places the department itself near the center of operations.

PBX, Public Address System

Our PBX operators are highly trained personnel, being schooled in voice for use on the PBX board and for giving announcements over our public address system. Notice of the arrival and departure of planes, as well as paging of airline passengers, is given over this system. Great care must be taken when making up the phraseology to shorten the speaking time, as it becomes necessary occasionally to revise all announcements to reduce the number given during the period of a day. At present they are running an average of one every forty-five seconds.

Each operator has taken special training in Spanish to announce arrivals and departures to Spanish speaking countries.

Follow-up System

We have developed what we term our "follow-up" system, in which all pieces of equipment, such as motors, transformers, air conditioning equipment and restaurant equipment are listed individually. Through this system a constant maintenance is carried on whereby periodic inspections are made in accordance to the particular piece of equipment.

For example, in the food and service department (restaurants and bars) where the equipment is used constantly, a weekly inspection is made, while on the motors operating the doors of our hangars it is only necessary to check once a month. This system has worked most efficiently and has saved us a great deal of money in replacement of parts and labor. This in itself has a direct bearing on the operation of all departments. By eliminating breakdowns it enables them to keep in full operation which creates a direct saving.

This system also gives us an exact cost of the maintenance of every piece of equipment on the terminal. We use it further to adjust our budget at the beginning of each year.

This subject will be continued for the next two months until we have covered every department. We realize that not all airports have their maintenance departments broken down as we have, and by the same token, they cannot use all of the ideas which have been submitted. Out of them, however, it is quite possible that somebody may get one idea that would be helpful. That's the only reason why the publishers of this magazine print this material and, likewise, it is the only reason why this writer takes the time to write it.

Kenneth Coryell is superintendent of maintenance at this terminal. As such he is responsible not only for budgeting of all items relating to maintenance but for actually maintaining the terminal and all of its facilities.

That's all for now. See you next month.

★ ★ ★

Uneven Distribution of Airports by Classes Shown in Latest Survey

A study of latest CAA airport figures, showing 3,692 airports as of July 1, shows an uneven distribution of airports by classes. The ten leading states and their rankings for total, Class II-and-smaller, and Class III-and-larger airports are as follows: Texas 1st, 1st, 1st; California 2nd, 6th, 3rd; Florida 3rd, 10th, 2nd; New York 4th, 4th, 4th; Michigan 5th, 3rd, 7th; Pennsylvania 6th, 2nd, 8th; Oklahoma 7th, 8th, 6th; Ohio 8th, 5th, 10th; Illinois 9th, 7th, 9th; Kansas 10th, 9th, 5th. Airport totals for each state in alphabetical order follow:

CLASSES OF AIRPORTS BY STATES
(July 1, 1945)

State	Total	Sub I*	CLASS I	II	III	IV and over
Alabama	62	2	9	16	15	20
Arizona	87	4	14	30	12	27
Arkansas	57	8	14	12	7	16
California	282	28	65	64	28	97
Colorado	67	6	19	25	6	11
Connecticut	22	5	8	0	4	5
Delaware	11	1	5	2	0	3
District of Columbia	3	0	0	0	1	2
Florida	191	1	29	33	55	73
Georgia	82	7	10	17	14	34
Idaho	58	11	20	14	6	7
Illinois	113	11	33	49	11	9
Indiana	90	10	22	37	8	13
Iowa	67	10	26	21	4	6
Kansas	112	9	52	15	13	23
Kentucky	25	2	6	8	4	5
Louisiana	55	5	13	17	3	17
Maine	37	8	4	6	10	9
Maryland	28	1	9	5	5	8
Massachusetts	57	15	14	11	7	10
Michigan	147	11	61	45	14	16
Minnesota	53	4	23	16	5	5
Mississippi	54	3	8	15	12	16
Missouri	79	8	19	27	13	12
Montana	88	11	27	28	9	13
Nebraska	62	7	18	17	2	18
Nevada	45	4	10	7	6	18
New Hampshire	16	2	3	4	4	3
New Jersey	45	4	16	14	4	7
New Mexico	75	6	17	22	6	24
New York	153	31	55	30	18	19
North Carolina	87	18	21	12	15	21
North Dakota	39	0	15	16	3	5
Ohio	119	14	38	47	12	8
Oklahoma	125	15	43	32	11	24
Oregon	52	2	8	10	13	19
Pennsylvania	142	30	57	34	12	9
Rhode Island	6	2	0	0	2	2
South Carolina	56	5	14	11	5	21
South Dakota	30	2	8	10	2	8
Tennessee	38	2	4	15	6	11
Texas	363	32	84	110	44	93
Utah	36	1	8	11	5	11
Vermont	12	1	6	1	4	0
Virginia	68	6	27	13	7	15
Washington	74	9	13	13	7	32
West Virginia	26	5	7	11	2	1
Wisconsin	58	4	17	27	8	2
Wyoming	38	0	8	16	6	8
Totals	3,692	383	1007	996	470	836

*Indicates airports which exist but do not come up to Class I standards.

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Red Seal
Engines

POWER TO WIN

"Great Work" — "A swell job" — or — "Right on the nose." In other words, "Congratulations for a job well done."

Thousands of fearless and able pilots who so capably direct artillery fire have contributed much to the downfall of Germany and to the victories over Japan.

More power to them and to the dependable Continental-Powered planes they fly.

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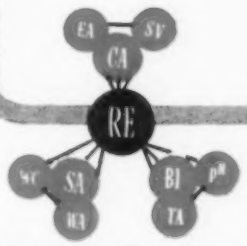
How to Remove Carbon and Lead from Stainless Steel Stacks . . .



Turco *Surface Chemistry** Licks Your Toughest Cleaning Problem

Proper cleaning of stainless steel exhaust manifolds has long been a number-one headache in the industry. However, it need no longer be either difficult or involved. Turco engineers, through modern Surface Chemistry, have perfected a simple, five-step procedure for removing lead, carbon and corrosion from stainless steel stacks.

This procedure is nothing more than immersion in Turco Prosolv B, hot water rinse, a second immersion in nitric acid solution, another rinse—then dry by air blast and the job's done. Simple, scientific, fast and fool-proof.

*THIS IS TURCO *SURFACE CHEMISTRY*

**This is* SURFACE CHEMISTRY: *Wetting Action, Emulsifying Action, Saponifying Value, Solvent Action, Colloidal Activity, Water Conditioning, Buffer Index, Energy of Alkalinity, Total Alkalinity, Research and Experience.*

Use Mulsine During Inspection

Turco Mulsine, with kerosene or any hydrocarbon solvent, in a sprayer is an excellent degreaser.

Mulsine bears the same relation to solvents as soap does to water. Its presence causes solvent, oil, grease and water to emulsify, forming a fluid mass that's easily removed by clean water and compressed air. Your Turco Field Service Representative will give you complete details about Mulsine and the Turco Mulsine Sprayer and air and water gun.

Fuzee During Overhaul for Engines and Parts

Through Turco Surface Chemistry* Turco scientists now make it possible for you to utilize the most effective solvents for cleaning aircraft engine parts, controls problems of fumes, volatility, odors and inflammability. The name of this remarkable compound is *Turco Fuzee*, a sealed physical cleaner that remains fresh and active indefinitely.

Good for crankshaft, reduction-gear, crankcase and blower, valves, springs and even bearings. Turco Fuzee will not harm the most highly finished surface. Carburetors, too, are efficiently cleaned in Turco Fuzee – without tarnishing aluminum, magnesium or other reactive metals. Fast, efficient. Turco Field Service Representatives can give you complete details and demonstration.

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Carboblast Process for Removing Residual Carbon

Using conventional sandblasting equipment, or the specially designed Turco Carboblast Cabinet, Carboblast quickly and safely removes the most stubborn carbon accumulation by means of lignocellulose pellets buffing the material in a blast of air. For cylinder heads, pistons, etc. – and wherever carbon is to be removed from narrow grooves, under-piston surfaces, etc.

Balanced Steam Cleaning with Turco Steam Aero

Another development in Turco Surface Chemistry is Turco Steam Aero for various aircraft surfaces. It is non-corrosive to aluminum, magnesium and other metals common to the industry. It removes quickly the soils found on aircraft surfaces —engine oil, hydraulic fluid, water streaks, adhesive dust and soil, etc. It does not lose cleaning efficiency in hard water, rinses freely without water marks, and prevents precipitates which clog steam vapor equipment. It is non-fuming, produces rich and ample foam without hazard to personnel.

In addition to facilitating cleaning during periodic inspection and maintenance, Steam Aero may be used for precleaning disassembled units prior to overhaul, and for steaming off fire walls and mounts during engine change.

Turco Chemical Vapor Cleaner

Ask your Turco Field Service Representative about the remarkable Turco Chemical Vapor Cleaner. Designed by Turco Chemists to operate most efficiently with modern cleaning compounds, it rapidly cuts down man-hours, costs and confusion. The Turco Chemical Vapor Unit can be operated by one man.

Free Book

Send for free book A-728: "How To Plan And Install Production Line Methods For Mass Automotive Engine Rebuilding." Contains diagrams and latest authoritative information on this profitable industry. Free. Please request on your regular letterhead.

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Fourteen-Mile Separation Dropped; New Spacing for Small Fields

The CAA has eliminated its preliminary recommended standards requiring fourteen-mile separation for airports at which instrument operations are conducted, and has issued a new set of recommended standards for airport spacing. For instrument-use fields the recommendation is in the form of a general statement requiring "sufficient separation from center to center to prevent conflict and overlapping in the holding and approach patterns during simultaneous instrument approaches.

In the case of smaller airports where flight is strictly "contact" the new recommended standards offer "as a general guide" a radius of only one mile for the pattern at a Class 1 field, and two miles at a Class 2 airport. Contact traffic patterns of Class 3 and Class 4 airports are recommended to have radii of three miles and four miles respectively.

Federal-Aid Airport Bills Postponed

Adjournment of both houses of Congress has postponed action on twenty-four important aviation bills, including proposals for Federal-aid airport programs, until the solons reconvene in October.

THOS. D. BROAD
ARCHITECT
For Dallas Air Terminal
Love Field
Burt Bldg. DALLAS R-4768

Michigan Begins Registration of Planes; Proceeds for Airports

The Michigan Aeronautics Commission on August 1 started the registration of aircraft within the state, employing an aircraft registration law similar to the automobile license law and applied to all aircraft operated over the lands and waters of the state, with the exception of scheduled airlines, aircraft owned by the government or states, and non-resident aircraft not engaged in commercial operations within the state.

Non-resident aircraft used for personal purposes will be permitted to operate within the state for a period of ninety days without registering with the State Aeronautics Commission.

Manufacturers of aircraft, aircraft engines, and dealers will be issued a general manufacturers and dealers number for a flat charge and will use these numbers on aircraft for sale or test purposes in a manner similar to the use of dealers plates on automobiles.

The registration fees are payable annually at a rate of one-half cent per pound of net weight empty. Proceeds go to airport development.

GE Plans Campaign on Airport Lighting

Miles C. McKearney, formerly account executive with Canton advertising agency, has joined Foster & Davies, Inc., of Cleveland to prepare a new General Electric national lighting campaign in trade magazines and in 187 newspapers. Because of McKearney's interest in aeronautics, he has also made a preliminary survey on airport lighting. He is a licensed pilot and has served as consultant to various municipalities on postwar airport plans. Work on the General Electric national lighting campaign will include airport and aircraft lighting.

CAA Intermediate Fields Available

Two hundred and thirty-one CAA intermediate fields have been offered on rental basis to operators who will maintain them. Most are grass-surfaced, all are lighted, and facilities include revolving beacons and telephone service. Of the total, 100 to 125 are near population centers.

Third Airport Users Conference on Aug. 20-21

The third in a series of Joint Airport Users Conferences sponsored by the National Aeronautic Association will be held in Washington, D. C., on August 20-21 at the Hotel Statler. Discussions will center around airport areas and airplane handling equipment as well as matters of finance, management and social significance as related to airports. Legislative aspects of the development of landing facilities will receive consideration, and prominent government representatives will discuss pending and existing airport legislation. Construction, maintenance and equipment men will be in attendance.

Eldon Postpones Airpark Dedication

Postponement of the Eldon, Missouri, model airpark dedication until early summer, 1946, has been announced by the Eldon committee in charge and the Missouri Department of Resources and Development, which said the postponement is due to ODT travel restrictions and requests from manufacturers for more time to prepare exhibits of airpark hangars and equipment.

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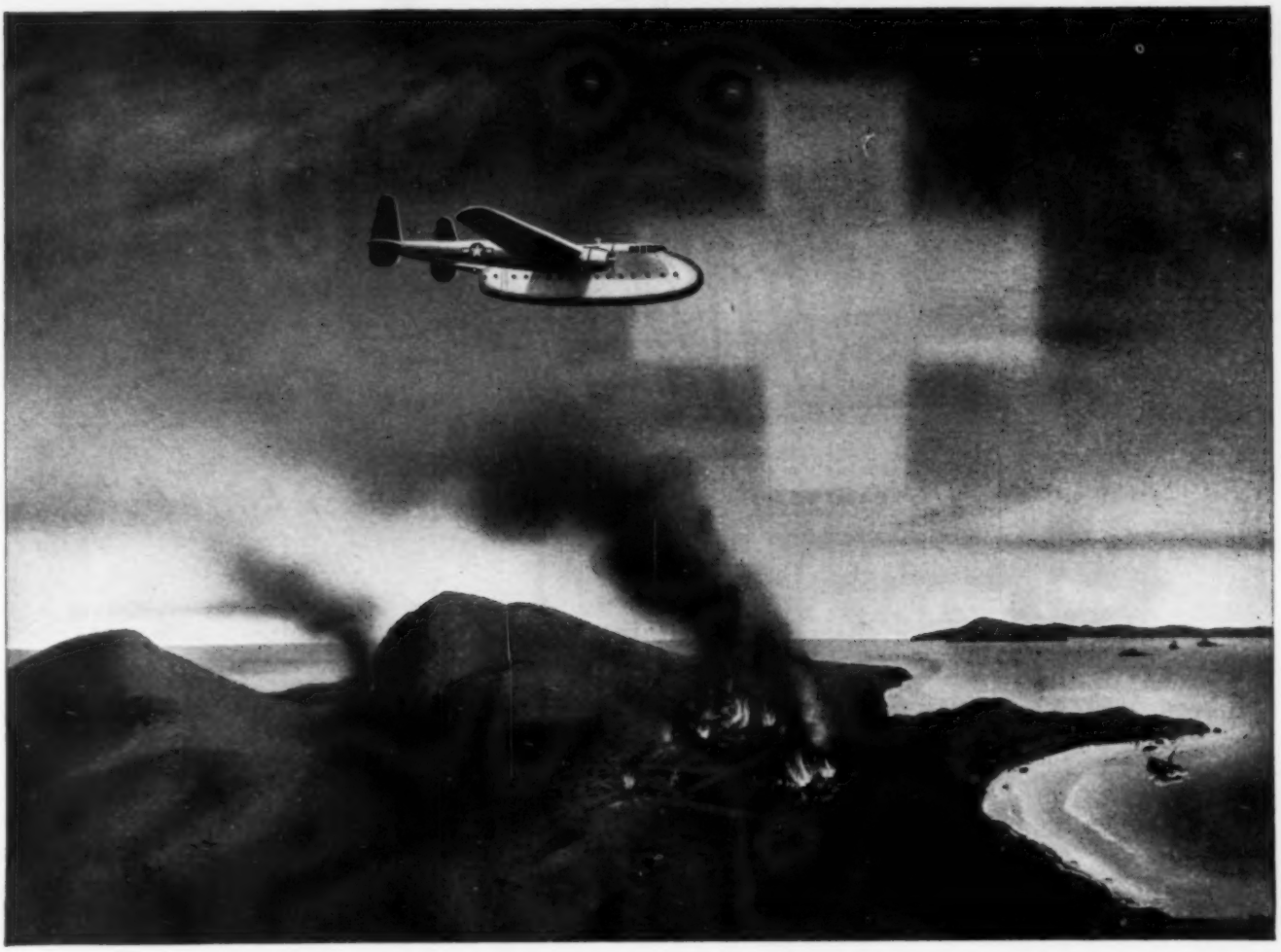

"You're an Angel...*with wings!*"

Ambulances fly in this war, and their flight brings swift evacuation of the wounded from the areas of front line danger. And because ambulances fly, the wounded are minutes, not days, from the clean sterile mercy of base hospitals.

Flying ambulances lend wings to the skills of doctors and nurses. For doctors and nurses and medical equipment go with the wounded in these hospital wards of the air. The skill of aeronautical engineers and medical science have thus combined to save lives and bring swift mercy.

Fairchild ingenuity, for example, gave the Army Air Forces the "Packet"—a plane in which men and machines can be carried into battle. But the "Packet" is a ship of mercy too, convertible *in a few minutes* to a plane ready to receive the victims of enemy action.

Known to the Army as the C-82, the long-range "Packet" can carry 34 litter cases, four attendants, and medical supplies. Cramped quarters do not hamper nurses ministering to the wounded. An ingenious litter suspension affords ample room for movement. So successful is this strap-suspension device, developed by Fairchild engineers, that it has become standard equipment on all types of planes used as flying hospitals.

Versatile in its applications, the "Packet" can do double duty as a mercy ship. It can carry the wounded from front line evacuation fields over long distances to base hospitals. Returning to the forward areas, it can carry up to *nine tons* of supplies needed at the front lines.

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland

THE ARMY NEEDS NURSES
—JOIN NOW!

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AIR MARKET DATA SERVICE

Published by Air Review Publishing Corporation, Publishers of **SOUTHERN FLIGHT**, P. O. Box 750, Dallas 1, Texas.

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The shelves of Pacific Airmotive's many Stores are again full of parts and supplies to meet your every requirement. Again, as for 13 pre-war years, the most complete stocks of standard airplane parts, engines, and accessories are available to commercial and private fliers from the Pacific Airmotive Store in their own vicinity. Pacific Airmotive is authorized sales and service representative for the leading manufacturers of engines, propellers, supplies and accessories.

SEE PACIFIC AIRMOTIVE FIRST—For genuine factory parts, guaranteed work, immediate service, economy, and safety.

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Logging The Coast

Looking very auto-ish, this roadable helicopter has been built in Los Angeles by Curtis Wright (a person, not the company) and W. J. Clark, who claim 50-mph. road speed and about 100-mph. airspeed for it. Powered by 90-hp. Franklin, it is 14 feet long and 9 feet high.

By.. Midge Winters

Los Angeles goes right ahead in aircraft manufactures — this time with announcement of three new planes for the postwar private flier.

One is the Aero Commander, built by the Aero Design and Engineering Corp., which aims for January flight tests. In the mockup of this twin-engine, five-six passenger, 1,000-lb. cargo plane, we noted its exceptional visibility and leg room. It has possibilities for feeder lines as well as private fliers and private industry who expect to operate their own fleets. Speed range is listed at from sixty-eight to 181 mph.

Twin-engine airplane of five-six place capacity has been designed by Aero Design and Engineering Corp. as executive plane and feederliner. Engines appear to be of 6-cylinder opposed type.

Number Two is the Jarvis V-J 21, which wants a name and is open to suggestions (write John LoBuono, 649 S. Olive Street. You remember John—he used to be with West-Marquis advertising agency, handling Western Air Lines, also with TWA in the good old days), is a pusher type plane, two-passenger, with a cruising speed of 110 mph., and a 400-mile range. Its design lends itself to amphibian or seaplane adaptation. Designer is Volmer S. Jensen, who built his first glider at the age of fifteen. Flights may be expected in September.

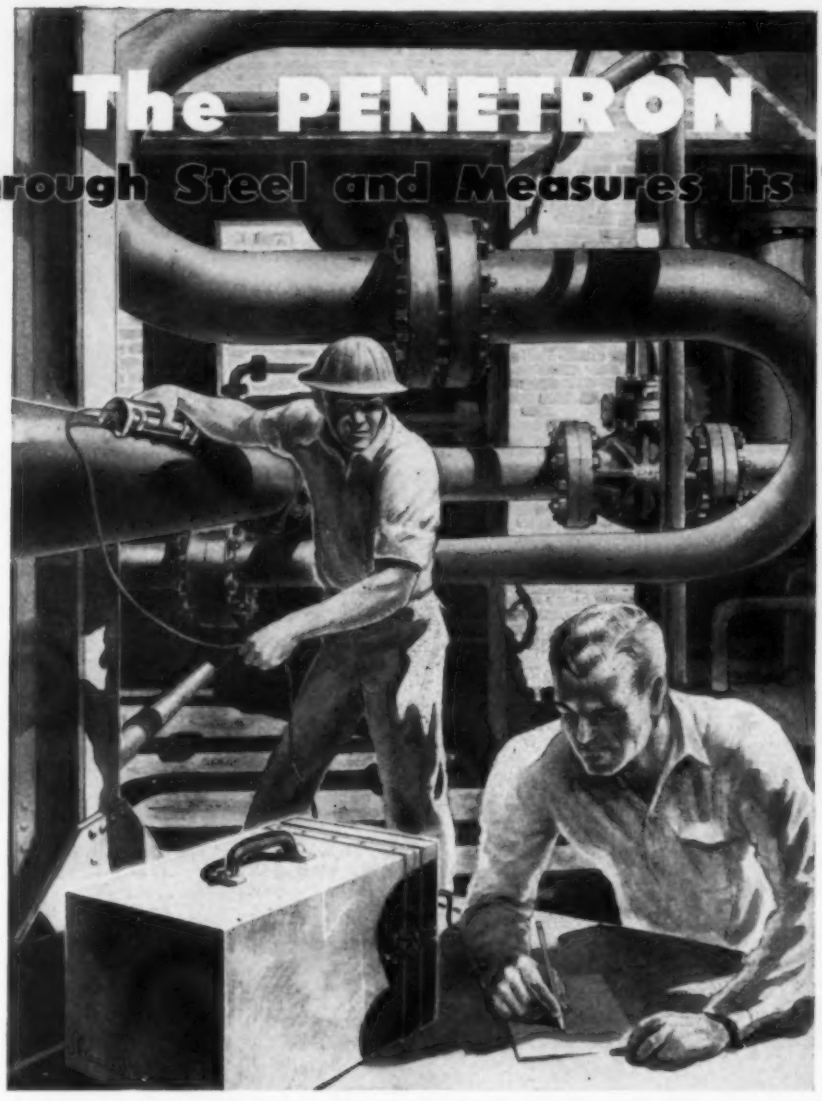
Number three is a helicopter, the first roadable one to be completed in Los Angeles, and built by Curtis Wright (not to be confused with Curtiss-Wright) and W. J. Clark. It is a two-passenger "coupe" with a road speed of fifty mph. and a flying speed of about twice that figure. Power is provided by an air-cooled Franklin engine. Rotors are about thirteen feet long. Sitting in the finished model, we discussed its capabilities, pronounced its fly-low-and-slow features as great for crop dusting, getting rid of Sunday traffic, finding our way under a fog blanket, and even dropping quietly down into lover's lane. Wright says four- and ten-place helicopters will also be built.

We could go into numbers four, five, and six, but they're still in wraps. For example, there's the seventy-five hp. two-seater being built by All Ameri-

(Continued on page 60)

The PENETRON

Looks Through Steel and Measures Its Thickness



THE PENETRON is an instrument which rapidly and accurately provides inspection data on lines, vessels and their contents without injury to the material being inspected. The PENETRON measures the thickness of any material from one side only, by use of penetrating gamma rays. It also determines the density of liquids, locates liquid levels or the interface between two immiscible liquids without access to the interior of the containing vessel.

Until the advent of the PENETRON, all the existing methods of inspecting materials have been time consuming, destructive, or have involved the use of cumbersome equipment. The PENETRON eliminates all existing difficulties by its extreme accuracy and portability, the complete unit weighing approximately 40 lbs. Designed by the Texaco Development Corp., the PENETRON has been licensed to Engineering Laboratories, Inc., as sole manufacturer and sales agent. Your inquiries will receive prompt attention.

Brochure on Request

Engineering Laboratories, Inc.

CONSULTING ENGINEERS & MANUFACTURERS

602-624 East Fourth Street Tulsa 3, Oklahoma, U. S. A.

FIRE PATROL
—Opportunity for Operators

These fires got out of control in North Georgia mountains. Air patrol would have spotted initial smokes, leading ground crews to exact spot for quick action. —(Photo by Clint Davis, U. S. Forest Service.)

Experiments in Georgia show aircraft operators can save millions in timber resources at nominal costs. Success points to profitable business for all concerned.

By BILL KEY

CO-OPERATION of Southeastern Air Service, Inc., of Atlanta, with the Georgia Forestry Department in an air fire patrol test may lead to a statewide project and steady business for several airport operators over the state.

Ben T. Smith, president of Southeastern, terms results so far very effective in fire suppression. The company, working with the Forestry Department on a 100-hour contract, is keeping close check on costs to determine feasibility of expansion.

Smith says that if the state decides to use air patrols for all forested areas he will recommend that local air service operators in strategic areas be given contracts for flying the patrols. This, Smith believes, will be more economical than to have one company (such as Southeastern) try to handle the entire state.

The current test is being run in five counties from Southeastern's Middle Georgia base at Macon. Two patrols of approximately an hour each are flown each day that weather conditions are favorable. Fortunately, adverse flying weather also retards forest fires and on rainy days there is little chance of fires spreading.

$8 Per Hour for Luscombe

Southeastern is flying the test patrol in a Luscombe 8-B at a contract price of $8 an hour. Radio equipment is furnished by the Forestry Department. In the preliminary test, plane-to-ground communication only is used. The test has shown that this one-way communication is feasible, although two-way radio on the ground trucks would enable the air patrol to maintain better contact. Two-way communication would be especially useful with several fires rampant and trucks dispersed. Then it is helpful to have the trucks reporting to the plane.

Charles M. Everett, state district forester at Macon, reported that the experiment shows that average time between reporting a destructive fire from the air to the start of suppression work by a ground crew was fourteen minutes. The air patrol is also proving especially effective in checking on the work of ground crews, Everett said. In a number of cases, the pilot-observer has discovered fires still burning after there had been plenty of time for them to have been extinguished.

Average distance from which smoke may be seen is sixteen miles in good visibility over the fairly level area now being patrolled. Majority of the forests in this section are pine, as are most of Georgia's woodlands. The fast-growing trees have become virtually an additional cash crop for Georgia farmers, and are expected to become even more valuable with the development of newsprint plants and plastics development in the years after the war. Despite this wealth in woodlands, there are large tracts throughout the state not adequately patroled and annual fire losses are great. An old farmer-custom of burning off woodlands is also responsible for heavy losses which plane patrols can prevent or catch before fires reach serious proportions.

Smith said he believed the tests

MODEL STATE AIR ROUTES FOR FLORIDA

FLORIDA aviation leaders have proposed a system of state air routes—off the beaten path of federal airways—which may become a national model. The program will be started this year by the state council of the National Aeronautics Association, one of the most active units in the country.

Strips in Swamplands

The need for the state routes was developed at the annual meeting of the council in Miami, with discussion centering around the basis for the state routes. These state routes will be designed to link smaller cities and provide cross-state air paths away from the established pattern set by airplane routes. They will be simpler than federal airways, in that radio navigation aids and other expensive installations are not recommended. Concentration will be on the development of air markers, map facilities and weather information distributed over the state police radio network. Another important element will be establishment of emergency landing strips along these routes in remote swampland sections and other places where standard airpark and other facilities are not available.

One big factor in the program will be activation of an aviation section of the Florida State Improvement Commission, into which the last state legislature wrapped all types of state development work. The law creating the commission gives it almost unlimited powers, but no action has been taken yet on the selection of a state director of aeronautics or the assignment of any funds for study of state aviation needs. The NAA council was instrumental in securing passage of the law creating the commission after it had been defeated in an attempt to secure a separate aviation department. Now it is attempting to convince Governor Caldwell, the most powerful voice on the commission, that action must be taken soon. Once a director is appointed, the NAA council will undertake to co-operate with him in outlining the routes, studying airpark needs, securing local material and labor for construction of air markers and other phases of a broad program.

Playford Directs Project

Harry R. Playford, St. Petersburg banker and airport operator, was re-elected president of the council to direct the program. William Howell, also of St. Petersburg, was re-elected secretary-treasurer. The number of vice presidents was increased one to five, and each will direct specific sections of the national NAA program within the state. Elected were: Wayne Gray, Orlando, air defense; C. T. (Al) Hanson, Miami, airways and airports; Don Bolton, Jacksonville, private flying; John Rainey, Panama City, transport; and Robert Stephenson, Fort Lauderdale, air youth.

Southeastern is flying will result in Georgia adopting air patrol regularly for most all forested areas.

In addition to providing a quick means of spotting blazes, the plane is helping arouse interest in prevention by dramatizing it for the persons in the rural communities who learn about the radio communication and gather around the ground trucks to listen in on WQWZ flying over counties of Bibb, Wilkinson, Baldwin, Jones and Twiggs.

Another advantage of the plane is that in addition to reporting to ground crews in the counties on the locations of the fires, the plane has several times guided the trucks through the backroads and logging trails on the quickest routes.

Keyed maps of the area are carried by plane and ground trucks for instantaneous location.

The pilot observes and handles communication as well as flight controls. It's a heads-up job for the hour.

Local Operators Favored

When sawmill sites where slabs and sawdust are burning are sighted, or when the pilot spots some individual setting a brush fire, warning "bombs" are used. They are handbills, attached to excerpts of the Georgia forest fire laws and wrapped in red bags. The pilot flies low and hurls them as near as possible to the fire site. The handbill tells about the air patrol and warns the individual to be careful. The Forestry Department says this type of bombing is having a very salutory effect. Since there are a number of air bases in the Macon area, the skies are fairly well scattered with planes. Fire setters can never be sure when one of those planes will be a patrol plane.

Smith says the test indicates a close margin on cost, counting the pilot's time. Under present conditions of civilian flying, however, the pilot's time is not fully occupied and the patrol is being run at times when there is nc rush of flight students at the base.

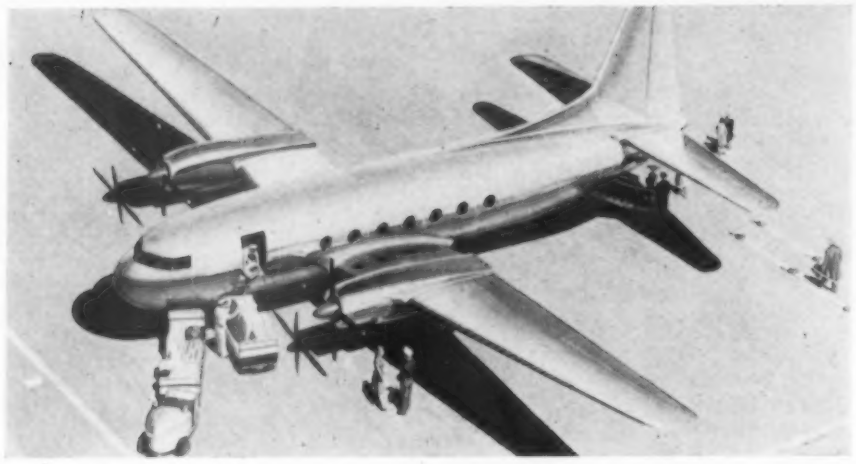
The test shows that patrols flown over a compact area, near the airport base, can be made without wasteful flying and therefore the cost can be kept reasonably low. However, costs would mount if it were necessary for the plane to travel fifty or 100 miles in order to reach the territory it is scheduled to observe. For this reason, Smith believes the Forestry Department, both in Georgia and throughout the South where similar forest conditions prevail, should contract with local operators for patrol of their immediate area.

The radio equipment now installed

(Continued on page 64)

All-out co-operation by Civil Air Patrol in early Georgia tests proved impracticable because CAP was not called in to help until smoke from widespread fires had made close observation impossible. Flights were made from this Dalton airport by planes sent from Atlanta. Bellanca in foreground, owned by Major Tom Daniel, Wing executive officer and coastal patrol task base commander, was used for most flights.

—(Photo by Clint Davis, U. S. Forest Service.)



Consolidated Vultee's latest design is this 30-passenger airliner said to have a 275-mph. cruising speed. Gross weight of 32,300 lbs. includes an 8,000-lb. payload. Power plants are 2100-hp. Pratt & Whitney engines with reversible pitch propellers for aerodynamic braking. Wingspan is 91 feet, fuselage 71 feet, wing loading 39.4 lbs. per sq. ft., stalling speed 79-mph. Dual wheels are used on tricycle landing gear. Note let-down passenger ramp.

LOGGING THE COAST

(Continued from page 56)

can Aircraft which aviation writers are watching like hawks; Consolidated's Flying Jeep, and Lockheed's Flying Jockstrap. Understand the latter really lands on a dime.

★ ★ ★

Bong Flies P-80

At a recent aviation luncheon, Major Richard I. Bong was called upon for a slight testimonial on the Lockheed jet-propelled P-80 Shooting Star. The listening audience didn't get the usual line of malarkey this time.

Said he simply, "I only have one hour and fifty-five minutes in the P-80, and I have to have at least twenty hours in a plane before I will say if I like it." He added with equal candor, "But if you're ever in a position where you don't want to fight, you certainly can get away in a hurry in the P-80!" During his first flight in the ship, the Major lost his wings —literally.

★ ★ ★

4,000-mph. Fighter?

At the same luncheon Hall Hibbard, Lockheed vice president and chief engineer, had everybody convinced that Flash Gordon and Buck Rogers are just about behind the times. In an excellent speech on jet propulsion, he described the possibilities of a rocket-fighter plane capable of 4,000 miles an hour 250 miles above the earth. "Slow speed planes" he described as 500 mph. and under. We also perked up our ears at the prospects of a jet-propelled helicopter—about ten years hence—which will have a cruising speed of 200 mph., a range of about 500 miles, and sell for the price of an automobile.

★ ★ ★

Doolittle Airport vs. Municipal

Big hullabaloo has been raised over Los Angeles City Council's recent action to name the Los Angeles Municipal airport "Doolittle Airport." Not that anyone wants to deny that the general's name is a credit to anything or anybody, but . . . we feel that Doolittle himself would be the first to advise Los Angeles to identify her airport with her own name . . . as a matter of convenience, as a matter of pride. Anyway, understand there's a let's-call-it-Los-Angeles-Airport committee already hard at work. In the meantime, Airport Director Woody de Silva is going crazy trying to educate all hands to stop calling the airport "Mines Field."

★ ★ ★

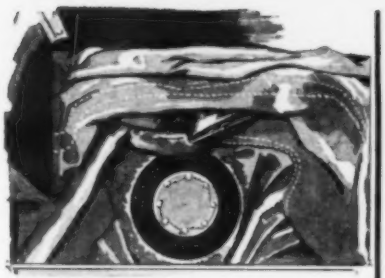
Seen and Heard

Somewhere, we've forgotten where exactly, someone said the C-74 might be used as a 125-place hospital ship. We didn't check this with Douglas public relations, or the military, and pass it on for what it is—scuttlebutt. . . . Another item in this same category is that this area might see the Bell Aircraft helicopter out here on a cross-country exhibition tour.

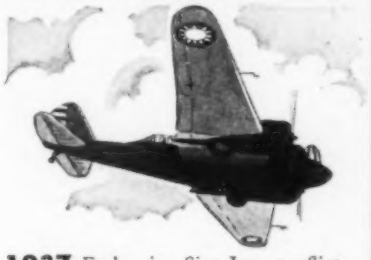
Welcome to Wilson Silsby, new manager of public relations at Douglas' Long Beach glamour plant. The past three years he has been director of industrial and public relations at Timm Aircraft. . . . Thanks to K. G. Farrar, project head in charge of production, Hal Stout, production control supervisor, and Fred J. Stineman, assistant chief engineer and chief designer, we now are thoroughly steeped in the prowess of the Douglas A-26 and just as anxious as they to hear the first official reports of action from that jack-of-all-combat in the Pacific.

Along the airline's "rowdy row" on West Sixth Street, Maxine Finley, United's Los Angeles publicist, is skipping those after-hours sessions to develop the lucrative hobby of importing and selling orchids from Venezuela . . . honestly, that's true. And Peggy Guetter Hereford, well known former airline publicist and more currently Wayne Parrish's West Coast representative, has retired completely to accept the role of motherhood. Taking her place with American Aviation is Fred Hunter, former United New York publicist known as "Laughing Boy" by closest associates. . . . Charlie Wrightson, United's Los Angeles station manager, is now the first man in the airline industry to complete twenty years of continuous service with one airline and its predecessor companies. SOUTHERN FLIGHT adds it congratulations. . . . Sol Voorhes, Lockheed factory representative, has, as we used to say in the lush old days, gone abroad—is in London on special business. . . . Western Air Lines announces new expansion in the creation of an engineering department, headed by Richard de Hart Williams, aeronautical engineer. Williams was formerly president of the Accessories Manufacturing and Engineering Co., Pasadena. Art Smith, formerly of American Airlines, has joined Western as assistant to Ray Grant, cargo traffic manager. ★ ★ ★

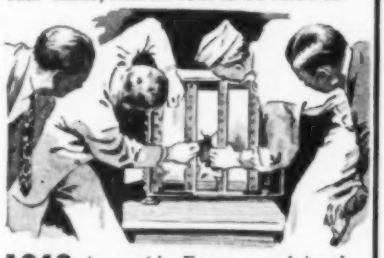
World's largest helicopter is the PV-3, designed and built by P-V Engineering Forum, Inc., for the Navy. Shown in flight, the machine carries ten passengers in addition to its 2-man crew in a bulky, 48-ft. fuselage between tandem-mounted rotors. A 450-hp. Continental-Wright engine powers both rotors. F. N. Piasecki is the designer. Performance figures are still restricted. Several PV-3's are being built for Navy-Coast Guard air-sea rescue and special transport work.



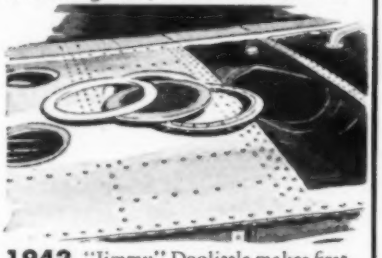
1936 First Mareng cell was aircraft fuel tank. If damaged, it could be pulled through opening, a new cell inserted like the bladder of a football. No need to remove wing, as with a metal fuel tank, thus simplifying maintenance.



1937 Early in Sino-Jap conflict, Martin 139 bomber of the Chinese Air Force returned to base with 19 bullet holes in Mareng cells. Sensing an answer to the problem of self-sealing fuel tanks, Martin redoubled research.

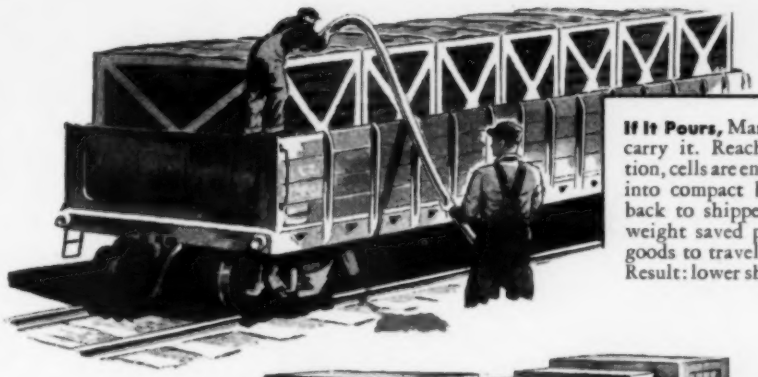


1940 Army Air Forces proclaimed self-sealing tanks a "must," Martin was first to respond. Martin engineers had been working on problem since1919 tested 285 materials. Above, Martin self-sealing tank, riddled with bullets.

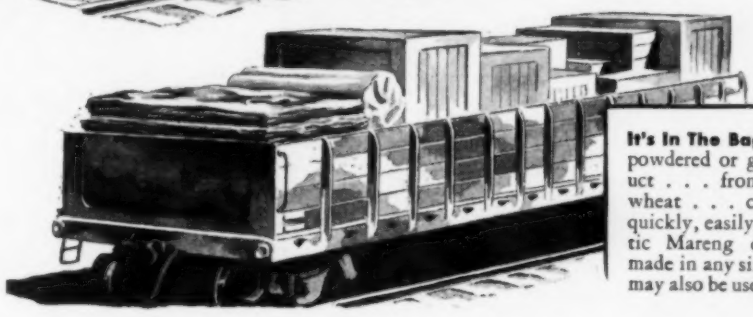


1942 "Jimmy" Doolittle makes first U. S. raid on Tokyo, his bombers given the needed range by special Mareng cells designed by Martin. Above, Mareng cell in B-25 of type used by Doolittle in his historic flight.

1945 Armored columns racing across Germany used big storage-type Mareng cells to set up fuel depots. Other storage cells, containing as much as 10,000 gallons, are quickly set up on captured Jap airbases to fuel our warplanes.



If It Pours, Mareng cells can carry it. Reaching destination, cells are emptied, folded into compact bundles, sent back to shipper. Space and weight saved permits other goods to travel in same car. Result: lower shipping costs.



It's In The Bag! Any liquid, powdered or granular product . . . from gasoline to wheat . . . can be loaded quickly, easily. Tough, elastic Mareng cells may be made in any size, any shape, may also be used for storage.

How New Elastic Container May Cut Shipping Costs of

liquids, powders, grains . . anything that pours!

AN entirely new type of container . . . which promises substantial savings in the handling and shipping of liquid, powdered, granular or other free-flowing materials . . . is rapidly becoming one of the most talked-of postwar products yet to emerge from Martin laboratories. These containers —known as Mareng cells from the first syllables of the words "Martin Engineering"—are, basically, huge elastic "bags." Designed originally as fuel tanks for aircraft, they have made vital contribution to the Allied war effort (see pictures at left) . . . hold equally high promise as a means of transporting peacetime products.

Many Advantages

Here are some of the advantages offered by the Martin Mareng cells:

1 In just a few minutes cells may be fitted into ordinary railway cars, trucks or barges, thus enabling these vehicles to carry liquid or free-flowing dry materials.

2 On reaching destination and emptied of their contents, cells are folded up and shipped to sender. One boxcar will hold enough empty cells to load six boxcars when cells are filled. This cuts round-trip shipping costs, eliminates haulage of empty tank cars or tank trucks.

3 Cells cannot be bent or dented, will not rust or corrode, yield under impact instead of breaking, are lighter and easier to handle.

4 If punctured, Mareng cells may be quickly patched, thus avoiding soldering or other time-consuming repairs required to patch metal containers.

We Welcome Suggestions

Busy with wartime production of Martin Mars, Mariner and other aircraft, the Glenn L. Martin Company has been unable to explore fully the peacetime uses of the Mareng cell. If you see possibilities for these elastic containers in your business or in other fields, we welcome your suggestions. Address, THE GLENN L. MARTIN CO., BALTIMORE 3, MARYLAND.

The Glenn L. Martin-Nebraska Company—Omaha

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THE Sky's the Limit

BY BILL GREEN

Kollsman's instrument survey brings out private flying's ideas about gadgets, . . . Cheap instruments aren't wanted at all, but many pilots desire compasses, sensitive altimeters, turn and bank, rate of climb and two-way radio. . . . But where will they put all of them?

The Personal Pilot on Instruments

FOR sometime we have been telling you what we expected in the way of the airplane in the future. A few days ago, we received a copy of a report of a survey made by the Kollsman Instrument Division of Square D Company which covered some 5,000 aircraft owners and pilots, apparently picked indiscriminately. It is of primary importance because it represents the experienced viewpoint in private flying.

The survey is extremely broad in the gadget field and provoked a good many interesting answers. For example, 96 per cent said they intended to purchase a new plane at an average price ranging between $2,000 and $4,000. Ninety-five per cent wanted compasses, 82 per cent wanted sensitive altimeters, 81 per cent wanted turn and bank indicators, and 63 per cent wanted climb indicators in addition to the basic contact flight instruments, as original equipment. Two-way radio came next as desirable standard equipment. Forty-six per cent checked the above equipment as optional, to be purchased for a fixed amount and financed with the plane, and only 3 per cent wanted the above instruments as separate purchases. One interesting factor was that only about 15 per cent selected cheap instruments, or low priced equipment, and there were many expressions of opinion against cheap instruments. It appeared that cross-country flying was almost directly proportional to the amount of instruments on the aircraft and the desire for additional instruments was foremost among those who did a considerable amount of cross-country flying.

It is interesting to note that some 50 per cent of the aircraft are sixty-five hp. or less, 25 per cent are in the sixty-six to 125 hp. class, 8 per cent are in the 126 to 285 hp. range, and 2 per cent are over 285 hp. Fifteen per cent of the owners own more than one aircraft in different hp. groups. Out of the 2,800 reporting on this survey, 1,092 said that there were a number of items of instrument equipment they desired but didn't buy because of too great a cash outlay required. This simply goes back to the fact that we have frequently mentioned—many people know what they would like but cannot afford to buy because the price is too great.

Ninety-four per cent indicated that they would purchase a new plane when it was available. Only 5 per cent indicated they did not expect to purchase a plane. Ninety-five per cent of the sixty-six to 125 hp. owners indicated they would purchase a new plane while 83 per cent of the over 285 hp. owners indicated they, too, needed new aircraft. If 94 per cent of the non-plane owners will buy new airplanes, that represents a really tremendous market, as there are now nearly a quarter of a million such pilots in this country. If this ratio holds true throughout all the non-plane owner pilots, there is going to be a boom.

Apparently, these people expect to pay well for their airplanes as 33 per cent will pay between $2,000 and $3,000; 20 per cent will pay from $3,000 to $4,000 and 6 per cent will pay from $4,000 to $5,000. Thus 59 per cent are willing to pay between $2,000 and $5,000. Twenty-two per cent wish to pay from $1,500 to $2,000.

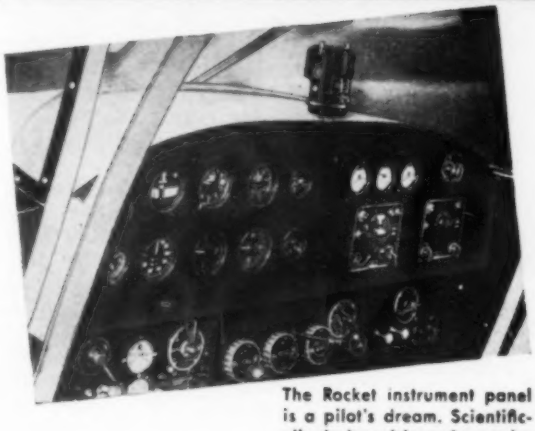
The largest group, that is those expecting to pay between $2,000 and $3,000 for their airplane, comprises 96 per cent who wanted a compass as standard equipment, 88 per cent wanted sensitive altimeters, 83 per cent turn and bank, 63 per cent wanted climb indicators and 21 per cent wanted two-way radio. Not over 9 per cent wanted other equipment such as radio direction finder, 8-day clock, good fuel quantity gauge, free air thermometer, directional gyro, gyro horizon, cylinder head temperature, and drift indicator. Forty-five per cent wanted the equipment as optional, were willing to pay $200 or more for it; 48 per cent wanted it for about $100 and 7 per cent wanted it for not over $50. Fourteen per cent thought it should be included in the cost of the plane, 19 per cent were willing to pay $200 or over for it, 45 per cent thought it should be about $100, 22 per cent thought not more than $50. As separately purchased items, 58 per cent were willing to pay $200 or more for such equipment.

It is interesting to note that 4 per cent of those expecting to buy $2,000 to $3,000 airplanes apparently had never done any cross-country as they didn't see any use in a compass. In the $3,000 to $4,000 price class, there must be even greater ignorance of cross-country flying as 10 per cent didn't care whether they had a compass or not. This probably indicates there were at least 10 per cent of those people contributing to this survey who had not flown cross-country solo.

These people were asked what other devices they would like to see available in an airplane, such as stall warning indicators, 33 per cent thought they would like a stall warning indicator while 65 per cent said they would not want such a device. Thirty-two per cent either didn't know or didn't answer.

There were a good many sample answers given which are interesting, such as one person who said: "If it takes an indicator to tell some people when an airplane stalls, they should not be allowed to fly." As a matter of fact, there have been a lot of stall indicators built into airplanes for a long time but people ignored them. Airspeed meters are very good stall indicators if anybody looks at them. Aileron control is a good stall indicator, and all the noises one is accustomed to in normal flight change tremendously as the stall approaches.

A number of people wanted a lot of other instruments such as the drift indicator, gasoline mixture indicator, angle of attack indicator, wind drift grid in floor of ship, single complete attitude instrument, level flight indicator, direct reading speed indicator, cylinder head temperature and fuel pressure in one, oil pressure and temperature in one, climb indication built in sensitive altimeter, altimeter automatically corrected for barometer and temperature changes, new-type turn and bank, sensitive pitch indicator, ball bank indicator, climb and ball bank combined, simple navigational aid, audible stall warning, safe glide angle indicator, safe approach angle



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indicator, directional gyro, artificial horizon and turn and bank combined in one instrument, instrument to show air pressure in tires while in flight, water trap for airspeed pitot tube, turn and bank as described in November, 1944, "Air Facts", stabilized drift indicator, etc. One wanted a device for instantly determining wind direction and velocity if possible in case of quick emergency landing, several people wanted accelerometers or G meters, some wanted horsepower indicators, many thought the instruments should be more accessible, and a number of people thought the instruments in light aircraft today are almost worse than none. Several people said they would rather pay more money and get better instruments, and so on and so on.

It seems to us after perusing the whole survey, that if everybody had all the instruments and equipment they wanted, they would simply need a living room for their instrument panel as the damn thing wouldn't fly with all the stuff in it they want.

We have long observed that engineering is simply a compromise between the ideal of performance and the ideal of safety as far as aviation is concerned. If absolute safety is obtained, there will be no performance and if ultimate performance is obtained, there will be no safety. Somewhere in between, we have to put up with this and until some smart fellow makes a lot of combination instruments, radio equipment, magnetos, etc., it looks like we are either going to fly with fewer instruments than we need, or else have all our two-place airplanes licensed for one person, etc.

Anyway, it looks like there is going to be a good market for lots of instruments and lots of airplanes, which means lots of airports, hangars, and jobs. Some kind of orderly and satisfactory developments will likely come out of all of this and it may be that as soon as Uncle turns us loose with plenty of tires, gasoline, and hotel accommodations, we can all get into the air and go some place.

For those lucky individuals who presently own aircraft, most of what we need is hotel accommodations ★ ★ ★

FLYING OFFICE for General Dwight D. Eisenhower is a special B-25 outfitted by North American Aviation, Inc. Here's Ike's fast-flying lounge, which has folding table, telephone and other features.
—(NAA Photo.)

FIRE PATROL

(Continued from page 59)

in the plane is much heavier than regulation aircraft radio and tends to reduce the utility of the plane. Smith suggests that equipment should be available soon which could be plugged in for the patrol flights and removed when the plane is used for other purposes.

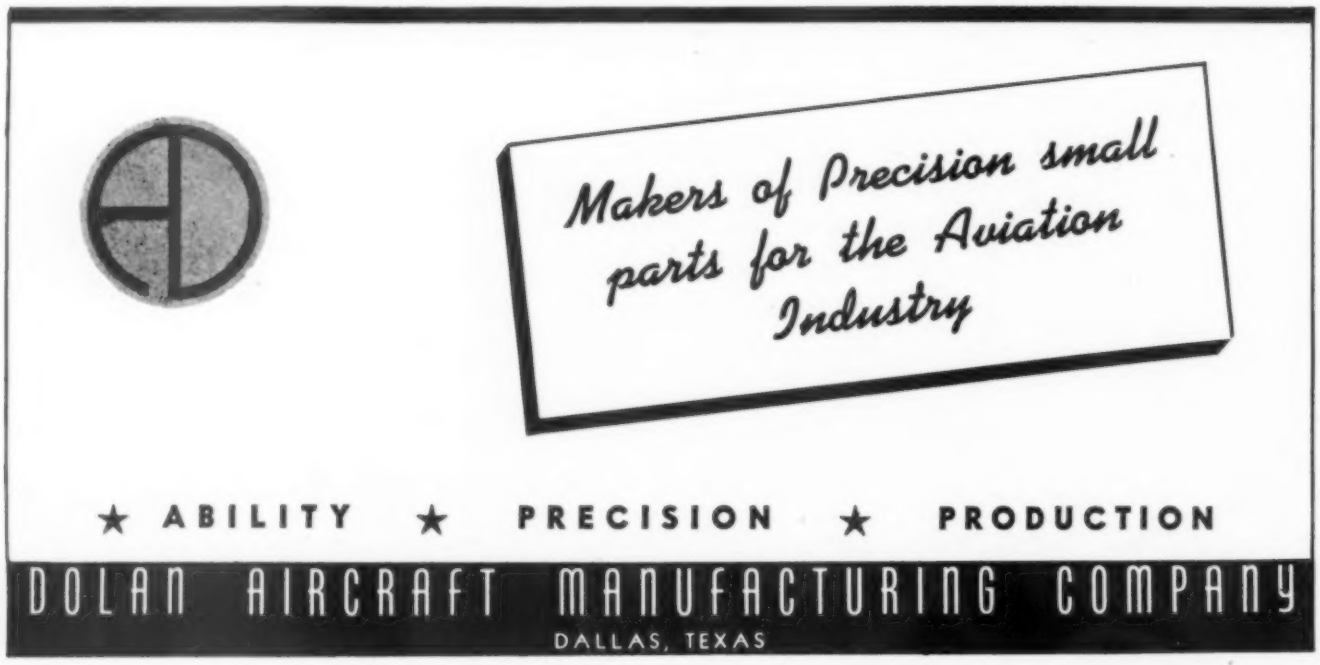
The greatest benefits of air patrol of forests come when patrols are flown on a regular basis to prevent and suppress fires. Patrols organized and flown after forest fires get a good start are relatively valueless. This was shown early in the war when test patrols were flown for the United States Forest Service by the Georgia and North Carolina Wings of the Civil Air Patrol.

At that time, extensive fires had broken out over a wide area of national forest lands in North Carolina and lands bordering national forest territory in Georgia. The writer, at that time serving on the staff of the Georgia Wing, helped arrange the flights, but it soon was found that smoke from the heavily-burning forests prevented detection of new blazes from the air and obscured, for the most part, the paths of already-burning fires.

U. S. Forest Service Air-minded

Contract operation of flights in connection with forest work follows the pattern of the U. S. Forest Service, which for years has leaned heavily on contract operators in the western forest areas. Planes have not been used extensively in the South by the U. S. Forest Service because of easier access to forest lands by roads, and because of the relatively small territory covered by national forests. Another factor has been the high cost of plane patrols in comparison with fire tower organization.

However, the Forest Service is getting more air-minded and has been experimenting with various methods of plane utilization. It hopes to continue contract relations with airplane operators, and the federal as well as state forest services should be contacted in the developing use of planes for various purposes in southern forest lands. ★ ★ ★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AIR POWER
In Action

By TOM ASHLEY

ALTHOUGH preparations for eventual American invasion of the Japanese home islands have been under way for many months, strategy has been adopted to hasten Japanese surrender through air power. Air power may not have been assigned to win the war alone, but it is being employed to destroy Japan and its resources so thoroughly as to (a) force surrender without invasion, or (b) pave the way for immediate invasion without serious opposition.

B-29's Now Unopposed

The Army Air Forces offensive has reached unprecedented heights in systematically burning and blasting out the very core of enemy resistance—Japanese war factories, communications, supplies and materials. For the first time in history targets for future air assaults were openly designated when the 20th Air Force dropped thousands of leaflets warning Japanese in eleven cities their towns had been selected for imminent destruction. Within less than twenty-four hours six of those eleven cities had been air blitzed, dramatically fulfilling Major General Curtis LeMay's threats. Such warnings, never before delivered, were expressions of 20th Air Force contempt for the Japanese Air Force, LeMay said, adding: "They can't do anything about it. We can destroy any target we want to, city after city."

Ample proof is available pointing to the impotence of the Japanese Air Force. The writer, checking the accompanying box score of air losses with 20th Air Force headquarters in Washington, asked confirmation of communiques which listed B-29 losses during July but failed to list any Japanese planes as having been destroyed by the B-29's. "They don't rise to fight us any more," was the 20th's matter-of-fact reply. "We can't shoot them down if they don't come up to fight."

Japanese Industry Being Destroyed

Even if B-29's are not drawing any Japanese fighters to their guns, they are still taking a heavy toll of Japanese planes. For example, it is calculated that the following factories have lost the following engines and aircraft which would have been produced if they had not been attacked by B-29's (as of June 26, 1945):

FACTORY	Engine Loss	Aircraft Loss
Kawaneshi Plant, Himeji	.....	250
Kawaneshi Plant, Naruo	.....	200
Hrio Aircraft Factory	.....	75
Mitsubishi Plant, Mishima	.....	100
Aichi Plant, Nagoya	450	300
Hitachi Plant	400	150
Mitsubishi Plants, Shizuoka and Nagoya	5,500	2,900
Nakajima Plant, Musashino	2,150	1,050
Total	8,550	5,025

Nothing can be a more important target for Japanese fighters than the B-29, for it is destroying Japan more than any other U. S. weapon. Failure to intercept B-29's is open admission of the JAF's defeat, at a time when the AAF is mounting its greatest offensive. Until now 800 B-29's have comprised the largest force of super bombers to operate against the Japanese homeland. Soon the total will reach 1,000 B-29's, 1,500 and 3,000. Moreover, operations from Okinawa, scheduled to begin any day, will triple the B-29's effectiveness. Lt. Gen. James H. Doolittle, whose 8th Air Force will operate 1,000 or more 29's from Okinawa, explains it this way: "Suppose that instead of flying a 3,600-mile round trip, carrying eighteen tons of gasoline and only four and one-half tons of bombs, we fly an 1,800-mile round trip. The gasoline load is then reduced to nine tons and the bomb load is increased to thirteen and one-half tons, three times the original load."

Fleet Powerless to Defend

History is being made almost daily by U. S. air power in its new Pacific role. With it the Navy in one week, July 21-28, hurling 1,000-plane forays against all Japan and its inland anchorages, finished off the Japanese fleet, once the world's third largest. Four battleships, four carriers, four cruisers and an assortment of lesser Japanese units were sunk, beached, gutted or rendered unfit for further action for many months. The Jap fleet can no longer play an important role in the defense of Japan against invasion.

Finishing Touch

While heavy bombers operated unmolested except for flak, smaller U. S. planes began ranging Japan in the early stages of all-out strafing of individual ground targets such as trains, highways, small boats, defense guns, etc. Operating from Iwo Jima, 146 Mustangs on July 29 shot up the Tokyo area at tree-top level. The JAF refused to intercept them, remaining on the ground. Only seven of the P-51's were lost in flak and accidents. Two days earlier more than 150 Thunderbolts strafed communications and small plants on Kyushu without serious opposition. With this background in mind, it appears General LeMay's warnings which named future B-29 targets vir-

LOSSES IN THE AIR WAR
June 25-July 25
(Does Not Include Probables or Damaged Totals)

	Pacific		S. W. Pacific		China		20th Air Force*
	Enemy	Allied	Enemy	Allied	Enemy	Allied	U. S.
June 26	12	....	....	....	....	1	5
June 27	1	....	....	....	1	....	....
June 28	1	....	1	2	....	....	....
June 29	4	....	4	....	....	....	1
June 30	2	....	....	....	1	....	....
July 1	1	....	....	....	....	....	....
July 2	....	....	1	....	....	....	2
July 3	2	....	....	1	....	....	....
July 4	....	....	1	....	....	2	2
July 5	....	....	1	....	....	1	....
July 6	6	....	4	1	....	....	....
July 7	11	....	....	1	....	....	....
July 8	1	....	5	....	....	....	....
July 9	10	....	2	1	....	2	....
July 10	113	10	....	1	....	....	1
July 11	....	....	....	....	....	....	....
July 12	1	....	....	....	....	....	....
July 13	....	....	....	....	....	....	3
July 14							
July 15	41	33	1	2	....	1	....
July 16	....	....	6	1	....	....	....
July 17	4	....	....	....	....	....	....
July 18	43	14	1	3	....	....	....
July 19	4	....	....	....	....	3	....
July 20	....	....	....	2	....	1	2
July 21	....	....	2	....	....	1	....
July 22	....	....	1	....	....	3	....
July 23	....	....	....	....	....	....	....
July 24	60	8	....	....	1	....	....
July 25	79	....	1	1	....	....	....
TOTALS	396	65	31	16	3	15	16
Totals since Jan. 1	6254	329	1291	117	663	215	132

*20th AIR FORCE: U. S. losses only.
SOUTHEAST ASIA: 4 Allied planes lost. Totals since Jan. 1, 143 enemy, 141 Allied.
(NOTE: These figures are compiled by SOUTHERN FLIGHT from daily headquarters communiques issued by the respective commands. They are, therefore, subject to periodic adjustment. Dates for Southwest Pacific are those on which figures are released; others when action occurred.)

LOSSES IN THE AIR WAR FOR 1944 — EUROPE: 9,907 enemy, 8,467 Allied; ITALY: 4,408 enemy, 3,631 Allied: SOUTHWEST PACIFIC: 3,612 enemy, 420 Allied; CHINA: 1,037 enemy, 262 Allied; SOUTHEAST ASIA: 406 enemy, 253 Allied; PACIFIC: 5,279 enemy, 445 Allied; RUSSIA: 13,989 enemy.

Seasoned Skill···

WITH A MODERN APPLICATION

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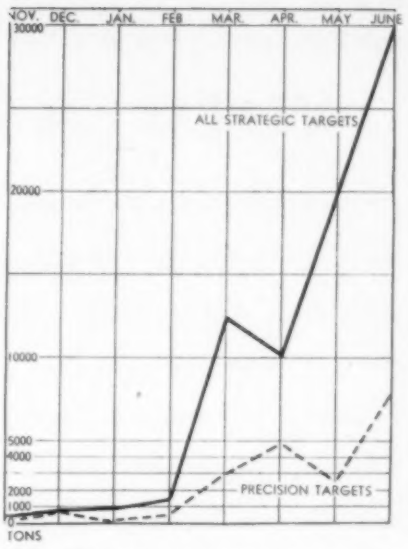
After victory, these skills which are now being devoted to production for the aviation industry, will be available to other manufacturers whose problems deal with fabricating heat and corrosion resistant products.

tually amounted to surrender ultimatums. More drastic challenges may be expected from the 20th Air Force.

Air power has invaded Japan on an all-out scale and a hastening time schedule to finish off the enemy. The destruction caused in July will be followed by still greater damage in August. If the Japanese fail to go down under the pounding, their homeland will be laid open to surface invasion, rendered defenseless by air assault many times more decisive than that which the Germans themselves credited with strangling Germany and its forces. ★ ★ ★



Of 61,055 tons of bombs dropped on Japan proper by Bomber Command during November-July 1 period, only 14,582 tons were on precision targets. Month-to-month record shows mounting intensity of strategic air offensive.
—(Southern Flight Chart.)

JET FIGHTER

(Continued from page 32)

stands eleven feet four inches high. With an 8,000-pound empty weight, it grosses about 14,000 pounds fully loaded, being about 4,000 pounds lighter than the P-38. Its tricycle landing gear is extremely short, the low-wing and fuselage hugging the ground.

Although described as being highly maneuverable, its control surfaces are much smaller than those on conventional planes, totaling only thirty-one and six-tenths square feet as compared to seventy and three-tenths square feet on the P-38. Lockheed-designed hydraulic aileron boost and balanced empennage controls give, according to Lockheed, "a maneuverability limited only by the pilot's ability to withstand the forces of tight turns and pullouts." It has the fastest roll of any plane in the world. Despite all this, pilots wear crash helmets similar to those used in the tank corps because of the violence in some maneuvers. The cockpit is pressurized but pilots also wear forced-feed oxygen masks and anti-gravity suits. Stall characteristics are said to be good, and the P-80 recovers from a spin in one-fourth to one-half turn.

String Indicates Yaw

One of the P-80's most important flight "instruments" is a piece of red wool yarn, about sixteen inches long. Fastened atop the nose near the cockpit, it is used as a yaw indicator. The average pilot usually finds himself riding right rudder in the P-80, despite the absence of torque, and finds he needs the string on frequent occasions. The Wright Brothers used dangling strings for turn and bank indication on their pioneering flights. The principal engine instrument is a tachometer registering revolutions per minute of the turbine compressor, which turns at speeds far slower than the P-38's turbo blower's 30,000 rpm. but above 10,000 rpm. Only engine control is the throttle.

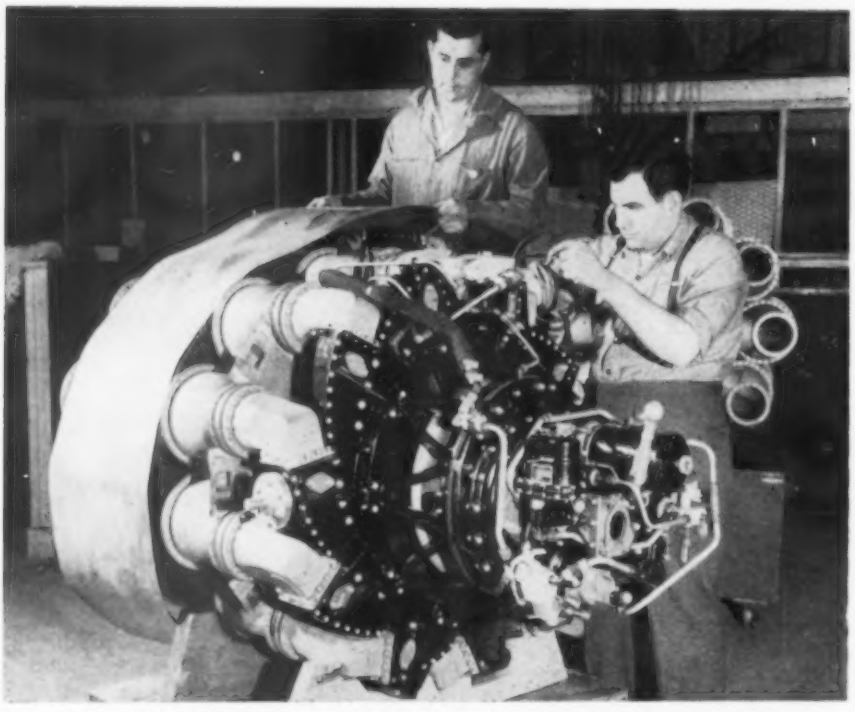
The GE turbo jet engine probably develops the equivalent of more than 4,000 hp., being the world's most powerful aircraft engine. It is mounted inside the fuselage about five feet behind the pilot, and is fastened to the fuselage by only three bolts. An engine change was recently completed in only eighteen minutes.

Weighing only about one-fourth as much as a reciprocating engine of equal power, the GE super jet is nevertheless bulkier and more complicated in appearance than earlier publicity indicated. Surrounding the compressor are fourteen separate combustion chambers mounted radially and converging into the exhaust pipe behind the firewall. Two airscoops moulded into the fuselage at the wing root flare out inside the fuselage. The air fills the entire fuselage behind the sealed cockpit, which ends abruptly behind the seat, leaving the mid-section completely hollow except for hydraulic lines and an assortment of plumbing and other gadgets. A coarse screen similar to hardware cloth protects the compressor from foreign matter in the air. Objects sucked into the fuselage would be harmless to it.

Kerosene fuel is pumped into the individual combustion chambers under pressure. A glow plug, heated by externally-supplied energy, starts the engine but thereafter combustion feeds on itself without timing or ignition.

Unique construction is employed in the Shooting Star. The flat, laminar-flow wing tapers at both leading and trailing edges. Its center line is two inches behind the midpoint of the fuselage. Of full cantilever design, the wing is built in one unit. Only half as many production manhours as are required for the P-38 go into the P-80.

Here's how Major Rudolf C. Schulte, an AAF officer recently returned from Germany, compares enemy jet fighters with the P-80: "Had it not been for our strategic bombing and its devastating results, we would have been up against German jet planes superior in quality—better than any of our conventional fighters for their short-range interception task. They would have been almost as good as the Shooting Star, those projected might have been better." ★ ★ ★



First photo of General Electric's super jet engine shows earlier design than now used on P-80. Framework between nose accessories and radial arrangement of 14 combustion chambers encloses compressor air intake.
—(GE Photo.)

Finish the Fight – with War Bonds

Peacemakers

Peace in the Pacific can be achieved in only one way—by the unconditional surrender of Japan's military masters.

To shorten the road to victory, our leaders foresaw that we must do more than reconquer territory yard by yard and island by island. *We must knock out the enemy's ability to make war.* And to carry out that strategy they chose the Boeing B-29 as our major weapon.

Built, tested and flown into combat under the terrific pressure of global war, the Superfortresses are doing all that was expected of them and more.

They have enabled us to reduce American casualties and save precious months in striking enemy war production, because they are the only aircraft in the world that can cover the vast distances from bases in the Marianas.

In early operations before present island bases were secured, they transported their own supplies over the "Hump" from India into China. They have not only reduced the output of Japan's war industries by the steadily mounting tempo of their bombing but have taken a huge toll of the fighter planes sent against them. And they have tightened the blockade on enemy ports by sowing mines.

The versatile efficiency of the Superforts reflects Boeing's unparalleled experience in designing and building four-engine aircraft, and it forecasts the same qualities in the great Boeing planes of the future.

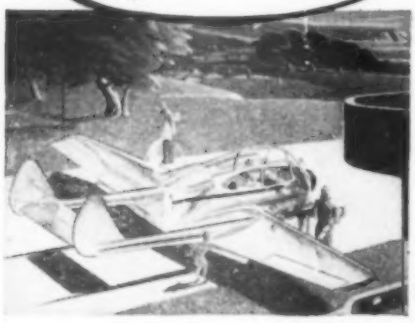
• • •

The performance of the B-29 stems directly from Boeing principles of research, design, engineering and manufacture. After victory, as today, you can count on any airplane "Built by Boeing" to lead the way.

DESIGNERS OF THE B-29 SUPERFORTRESS • THE FLYING FORTRESS • THE NEW STRATOCRUISER
THE KAYDET TRAINER • THE STRATOLINER • PAN AMERICAN CLIPPERS

BOEING

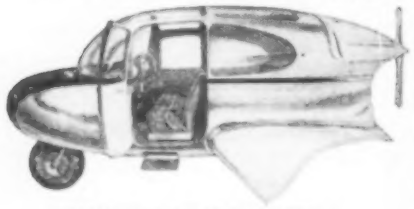
BEAUTY
FEATHER POWER...DEPENDABLE SAFETY
IN YOUR NEW
SKYCRAFT



The safe, smart practical airplane experienced pilots and eager novices hope to own

Designed by one of America's foremost aeronautical engineers, the new Skycraft will possess many features of speed, power, safety, utility and economy never before built into a personal plane. From the tip of its sleek nose to its slender twin booms, you will find that the new, pusher-type Skycraft will produce an ease of flying and of landing . . . of extra speed and maneuverability . . . of comfort and security for one or the whole family, on business or on pleasure . . . it's the safe, smart, practical future airplane the experienced pilot and the eager novice have hoped someday to own. Right now — the construction of vital warcraft parts comes first . . . so, plan your order now, for Tomorrow!

COMMODIOUS INTERIOR



WARCRAFT PARTS UNTIL . . .

The Skylark Manufacturing Company is engaged in the precision-manufacture of motor mounts, flame dampers, truss assemblies and other parts vital to combat planes of the allied nations. Perhaps Tomorrow—conditions will permit *all-out* production of the Skycraft.

Designed and Manfactured by

SKYLARK
MANUFACTURING COMPANY, Inc.
Airplane and Parts Craftsmen Since 1934
350 WASHINGTON BLVD., VENICE, CALIF.

FLIGHT INSTRUCTOR

(Continued from page 42)

angle. Since no pilot would have time to fly if he memorized the procedures of all the airports he uses, the stranger probably will not know the point of entrance required by local rules. I have found one simple rule which works everywhere. Whenever I approach or pass near an airport, I fly so that I can see the entire field on the left of the nose of the airplane. If the field happens to be one of the few which follows a right-hand pattern I can see it in time and simply reverse the rule.

Observing the traffic in the air and on the ground, the pilot should plan his flight path and landing approach to meet the situation. He can do this only by keeping an open mind and not follow any rigid procedure which may have been suitable only at the field where he learned to fly. If he is flying a Luscombe, his altitude should be a little lower and his flight path closer to the field than it would be in a Waco. The pilot of the Corsair should remember that his approach speed is about thirty miles greater than that of the Waco ahead of him and should widen his pattern to absorb the difference in speed.

The Corsair pilot was probably taught close-in circular approaches from a low altitude. He should remember that he was taught this kind of approach to prepare him for the highly specialized job of landing on a carrier. At sea you don't have trees, buildings, wires, and radio aerials sticking up at you—reducing your true altitude. On a carrier, the other airplanes in the pattern are similar to yours and will follow the same approach plan. Above all there are two evils to choose from. The danger of a low turning approach must be risked in order to land the greatest number of airplanes in the shortest period of time. Using such an approach at a large public airport is not only dangerous, but defeats the purpose for which it is used on a carrier—it slows down the handling of traffic.

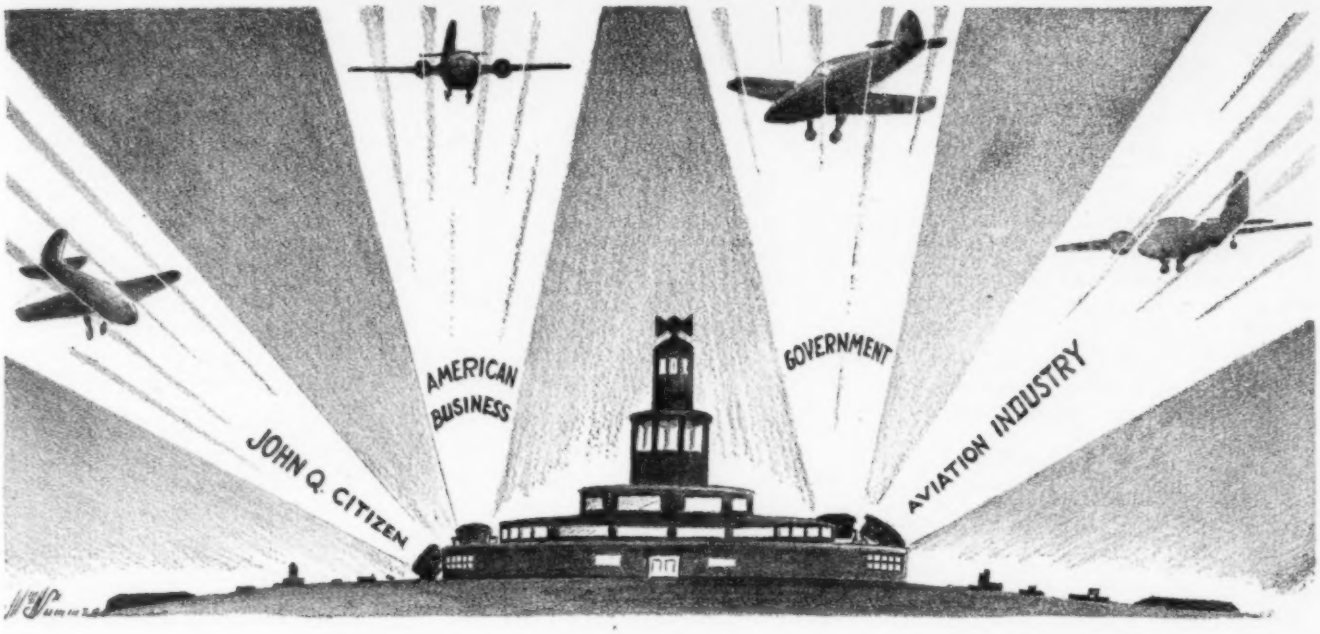
One experienced Navy pilot told me that, contrary to the idea of most younger pilots, the final straight approach to a carrier is actually longer than the 1,000 feet recommended on land. Since the ship is the only reference point by which the pilot can judge, and it is moving away from him, it only *looks* as though he rolls out of his final turn close to the point of landing. The close-in approaches taught on land in preparation for carrier work make allowance for this optical illusion.

Some Army pilots make what they call a "tactical approach." It is similar to the typical Navy approach, but usually includes a dive with excessive speed on the downwind leg, a steep turn to kill speed, rolling out just before the plane touches the ground. I cannot believe that any pilot is sincere who maintains—as some do—that this is the safest approach under any conditions. Some argue that it gets you on the ground quicker. I'll go them one better. I have seen two cases which got the pilot under the ground quicker. These pilots just ignore the other planes which are delayed because they are cut off by the show-offs. Others argue that you can keep your eye on obstructions better in this type of approach. Recently, I saw three pilots in succession misjudge their approaches over obstructions. The first stubbornly stuck to his intentions, hauled back the stick and stalled in, ground looping to avoid going through the fence. The second gave it the gun when he was nearly stalled, the torque snap-rolled him and he burned. The third realized he had misjudged and decided to go around while he still had enough airspeed to control the airplane.

"Students who trained at Army-dominated schools think the pattern must be a perfect rectangle, while those who learned under the supervision of the Navy are convinced that an oval pattern is the only way to fly around a field."

The second approach of the third man was the best kind of approach over obstructions when power is available. A long, low, straight approach on power until the obstruction was reached. Then he reduced the power and the plane settled steeply, but still with good control. That is what I call skillful flying. ★ ★ ★

This is the first of a series of advertisements concerning the future of Aviation . . . in America



National Security demands Wings

(A FOUR-PART STORY)

NATIONAL Security and Permanent Peace . . . through Air Power. Words of comfort for the future, but only if the ideas behind these words are put into action!
Air Power for Peace instead of Air Power for War will demand four-way cooperation . . . with Private Citizens, American Business, Government and the Aviation Industry all joining hands.

◀ PART ONE ▶

John Q. Citizen is part of the story. His interest in private flying, fast transportation, local air terminals, air strips and air parks; his support of air shows and exhibits; his interest in aviation literature, books, education and research; his participation in aviation organizations . . . all these are specific ways in which he will help make peace through Air Power a reality.

◀ PART TWO ▶

American Business also will contribute much to the progress of American Aviation and Air Power. For aviation shrinks the distance between markets; opens new sales channels; means closer coordination of far-flung plants and access to almost any part of the world in a matter of hours instead of days and weeks. And, in the case of Helicopters, even to places normally inaccessible by air.

◀ PART THREE ▶

Government, too . . . Federal, State and Municipal . . . will play its role. Already many steps have been taken to promote aviation and Air Power and other steps are under way. Training facilities . . . roads and highways . . . safety regulations . . . encouragement and development of scientific flying aids and international air transportation . . . perfection of airport facilities . . . creation of commissions charged with promoting aviation wisely and for the benefit of all . . . these are just some of the areas in which Government can be and *is* a vital part of this story.

◀ PART FOUR ▶

And . . . the Aviation Industry. Under the stimulus of war the progress and technical advancement of the Aviation Industry has been an industrial miracle. The entire industry is dedicated to a continuance of the scientific research which has made America foremost in the Air. At Bell Aircraft we shall put into civilian service the skills and achievements identified with the Airacobra, the Kingcobra, the Bell Built B-29 Superfortress, the Airacomet (America's First Jet Propelled airplane), the products of our Ordnance Division and the Bell Helicopter. The challenge of Peace will provide us with a stimulus as urgent as the desperate needs of war.

★ *Buy War Bonds and Speed Victory* ★

MEMBER AIRCRAFT WAR PRODUCTION COUNCIL...EAST COAST, INC.

BELL *Aircraft*

PACEMAKER OF AVIATION PROGRESS

NIAGARA FRONTIER DIVISION
Niagara Falls, N. Y.
Airacobra (P-39) and Kingcobra (P-63)—Fighters
Airacomet—America's First Jet Propelled Plane
The Bell Helicopter

ORDNANCE DIVISION
Burlington, Vt.
Flexible Gun Mounts and other ordnance materials

GEORGIA DIVISION
Marietta, Ga.
Bell Built B-29 Superfortress

© Bell Aircraft Corporation

SUPER LIBERATOR

(Continued from page 29)

ings in existence. For bomb load carried, it has a greater range than any plane of similar weight. Artificially aged and stretched aluminum alloy skin and other innovations in the production model slashed the wing's weight by over 1,000 pounds. Wing area totals 1,422 sq. ft. for the 100,000-lb. airplane. The wing has a three degree incidence, a dihedral of three degrees and twenty-six minutes, a sweepback of three degrees and thirty minutes and a taper ratio of 3.075:1. Flush riveting is used throughout the wing and fuselage skin covering for increased streamlining.

Its aileron trim tabs are electrically controlled by a switch in the cockpit, a feature never before used on four-engine bombers. A tension regulator operates to prevent flight control cables from becoming slack at high altitudes and in extreme cold temperatures.

Power Plants

While the B-32 is equipped with 2,200-hp. Wright Cyclone engines, each with dual turbo superchargers, its power plant installations contain several improvements over those on the B-29, which is powered by the same engines. B-32 engines are interchangeable. In addition, engine nacelles were designed with a maximum of accessibility. A mechanic can descend into the nacelle through a large door at the top, while virtually all the cowling and cowl flaps are readily removable. A complete engine change in only two hours is possible. Each nacelle has a monocoque section attached to the wing's leading edge with five structural bolts. Fire extinguisher systems enclosed in the nacelles are capable of putting out average fires in two seconds.

Consolidated Vultee engineers say the B-32 has "very adequate" cooling characteristics. Propeller cuffs are employed, and the nacelle intake scoop is of a new design.

A unique feature is the design of engine flight hoods, located just below and at about the wing's leading edge, which are described by the manufacturer as contributing about 110-hp. per engine through a jet effect when the B-32 is traveling at top speed and at optimum altitude.

Hydraulic System

Whereas the B-29 was hailed as being an "all-electric" airplane (it has approximately 150 electric motors of various sizes), the B-32 is a "hydraulic" airplane. Its pressure system is centrally located to reduce vulnerability from shell fire, and all hydraulic lines are protected by fuses which stop the flow of fluid in lines which may become punctured. Selector and brake valves are located as close as possible to the units they actuate to reduce line lengths. The valves are electrically or cable-operated by remote controls, with manual controls furnished for emergency. Two separate brake systems are provided. In reality the hydraulic system is three systems — the main system depending on engine-driven pumps, one emergency system driven by electric pumps and the second emergency system being operated by hand pump.

Electric System

However, the B-32's electrical system is extensive, for electricity controls its propeller pitch, automatic pilot, bomb release system, turbo-superchargers, starters, cowl flaps, intercooler shutters, air cooler shutters, carburetor filters, engine primers, carburetor preheat system, cabin heating system and the five gun turret actuators. Its seven-mile wiring system is composed of three wire loops, any one of which carries sufficient power to operate its electrical system. The B-32 is the first plane of its size incorporating the triple-wire loop.

Production

Because B-32 production is comparatively small, it is all contained within the Consolidated Vultee factory network, chiefly at Fort Worth. No outside firms build the airplane, although it contains a mass of materials and parts obtained elsewhere. In the B-32 are 59,290 purchased parts, 53,-290 raw material parts, 89,775 bolts and nuts, and 700,000 rivets. A comparison of these figures with those for B-24 production is interesting. That airplane contained 52,929 purchased parts, 49,343 raw material parts, 85,-500 bolts and nuts, and only 400,000 rivets.

Special tooling went into production facilities for it. The Fort Worth factory, for example, constructed and is using the world's largest master tooling dock. An innovation was developed in spare parts handling, in which B-32 spares were produced and delivered to Pacific operational bases before the completed airplanes reached their bases.

Transition Training

From engineering through production and training the B-32 project has had an unusual advantage in the location of the first training school. It is located at Fort Worth Army Air Field, adjoining the giant factory. Moreover, headquarters of the Army Air Forces Training Command are at Fort Worth, and Lt. Gen. B. K. Yount and his experts have been right on the sidelines throughout the training project. Heretofore, as in the case of the B-29, new combat planes were assigned to one of the "training" air forces in the United States for transition crew training. But the B-32 was assigned directly to the AAF Training Command before entering combat. Considerably in advance of Germany's collapse, the Army took numerous B-24 crews who had finished their operational training in the Fourth Air Force, and instead of sending them on to Europe, assigned them to the B-32. Hence the first B-32 crews in combat were former B-24 crews, except for the aerial engineers. Conversion of Fort Worth Army Air Field from B-24 transition training to B-32 transition was begun in February, 1945. The transition course begins with the aerial engineer. Unlike the B-29's flight engineer, who is an officer, the B-32 engineer is an enlisted man. He arrives at Fort Worth eight weeks ahead of graduation time and enters ground training, concentrating on line maintenance. Two weeks later the airplane commander (pilot) and co-pilot arrived, and spend their first week in ground school. In the final five-week period the three-man trio receives fifty hours of flying. Prospective B-32 commanders must have from 105 to 1,000 hours of flying time in B-24's or B-17's.

General Yount and his B-32 training officers established an extremely elaborate and thorough maintenance procedure for B-32 training. Eighteen hundred men were assigned to the B-32 line. Each airplane receives a seven-hour check every day. The twenty-five-hour check requires twelve hours, and fifty-hour and 100-hour checks combined require twenty-four hours to complete. "We are operating a proving ground, so to speak," commented General Yount. Behind all this thoroughness was the fact that the B-32, like all new tactical models, contained "bugs". They were corrected as quickly as discovered.

While the B-32 is a remarkable bomber in numerous respects, the effect of constantly changing war conditions will probably minimize its role in combat. Comparatively few are being built, but the B-32 will undertake highly-specialized air operations. Although B-29's have already delivered massive assaults against the enemy's strategic resources, there's a vital groove waiting for the B-32's, and Japan is destined to reel beneath a new and deadlier intensity of heavy bombing when the B-32's close in for the kill.

★ ★ ★

45 man-hours slashed to 15 minutes!

Here's another example of the way Cherry Blind Rivets cut down airbase repair time and costs, produce better finished jobs.

Patching this vertical stabilizer on a DC-3 with ordinary rivets would have necessitated tearing down the structure, tying up the ship and several workmen for a total of 45 man-hours. With Cherry Blind Rivets, the entire job was done by one workman in about 15 minutes. This job was done at Western Air Lines Repair and Maintenance Base, Lockheed Air Terminal, Burbank, California.

Cherry Rivet speed is due to such factors as these: They're a one-man rivet. They upset from one side of any blind spot without any bucking. Small, lightweight Cherry Rivet guns reach hard-to-get-at spots quickly and easily. No size-drilling or reaming is required—generous tolerances and exceptionally broad shank expansion allow hole size variations to .008". Material thicknesses may vary up to .062" for the same grip length rivet. (Both of these figures are factory recommended tolerances. On some applications, even greater variations are practical.) Action of both rivets and guns is mechanically positive.

PHOTO COURTESY WESTERN AIR LINES

For a quick glance at the whole story of Cherry Riveting, write now for Manual D-45, Department A-145, Cherry Rivet Company, 231 Winston Street, Los Angeles 13, California.

Cherry Rivet Company
LOS ANGELES 13, CALIFORNIA

CHERRY RIVETS, THEIR MANUFACTURE & APPLICATION ARE COVERED BY U.S. PATENTS ISSUED & PENDING

Aircraft Schedules Down To $2,500,000,000 Monthly

Aircraft production schedules have been reduced from $3,700,000,000 a month as of March 1, to a rate declining to $2,500,000,000 a month in the fourth quarter of the year and will continue until the second quarter in 1946, according to the War Production Board, production readjustment committee. The cutbacks represent a 32 per cent decrease in expenditures in aircraft production, as compared with 30 per cent for war production as a whole. Reductions have been approved in tight labor areas in preference to loose labor areas. The committee made its report to the Mead Committee of the Senate.

Labor Needed for Southeastern Industry

Skilled workers are needed by war plants in the Southeastern states to meet production schedules for Army Air Forces aircraft and equipment. The states affected are Georgia, Florida, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Mississippi and Tennessee. The only major cutback in the region was the P-38 program at Consolidated Vultee in Nashville. As a result of a leveling off of B-29 production, Bell Aircraft Corporation has reached its peak output of Superfortresses and is expected to maintain this schedule. While total employment at Bell has leveled off there is still an acute shortage of electricians and engineers at the plant.

Partial Operation of Government-Owned Aircraft Plants Sought by AAF; Idle Storage Not Planned for Peace

Postwar plans of the Army Air Forces concerning the use of government-owned aircraft plants center around operation and not idleness Maj. Gen. E. M. Powers, assistant chief of air staff, material and services, stated in announcing a proposed "standby" program for the AAF built around productive use of government-owned facilities by private industry, instead of using the plants for airplane stockpiles.

The complete text of General Powers' statement follows:

"Since the effectiveness of any Government 'stand-by' system is measured by the ability which it provides to expand production rapidly in an emergency, the Army Air Forces strongly favors partial peacetime utilization of reserve productive capacity in order to maintain the production know-how of workers and management and to keep up the community facilities and the system of suppliers and subcontractors. It is obvious that a plant in partial operation, particularly if engaged in a similar or related type of work, has special advantages for conversion to aircraft production as compared with an idle plant which lacks experienced personnel.

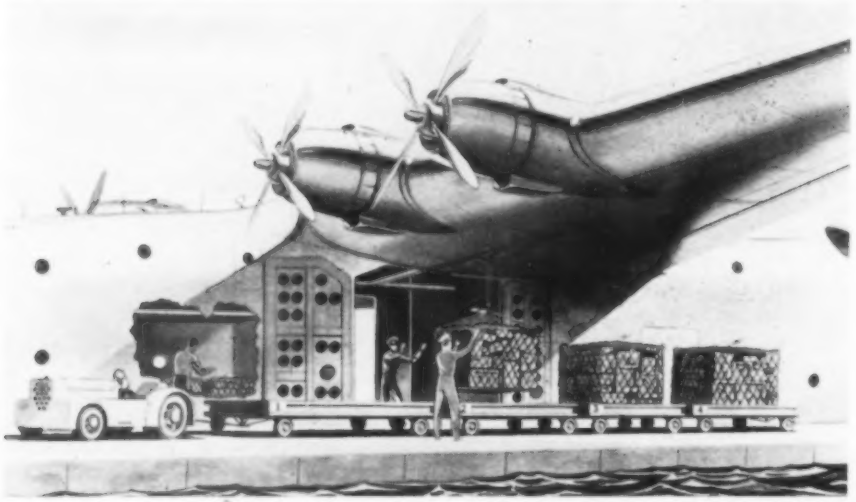
"Since it is worse than useless to stockpile airplanes as a war reserve, we are interested simply in providing a reserve of productive capacity of a specialized type. Our concern is, therefore, for the preservation of special characteristics such as broad assembly aisles and high clearances in airframe plants, and in the case of engine plants we are primarily interested in test cells or other special construction. Likewise, when one of our plants has a good airfield adjacent to it, we are reluctant to see the investment in runways lost for lack of minimum maintenance. A lease arrangement containing prohibitions against permanent structural alterations which would delay or prevent conversion to aircraft production—plus some provision for prompt availability of the facility in an emergency—would satisfy the primary needs of the Army Air Forces. I do not believe that these restrictions would be burdensome on a manufacturer or group of manufacturers who have a program to make use of such facilities.

"Only as a last resort, in our opinion, should plants be retained in idleness. Our first preference, obviously, is to have them partially operated by aircraft companies. Our second preference would be to have the facilities partially utilized by other types of manufacturing companies. If no operators can be found however, we must be prepared to maintain idle plants so that we can be adequately prepared for a rapid expansion of aircraft production in an emergency.

"There are almost endless combinations of operation and 'standby'. For example, an aircraft company or other enterprise might occupy one-quarter of a plant and have no use for the adjacent air field. The Army Air Forces might retain the remaining three-quarters of the plant and the air field as standby, possibly making a maintenance contract with the resident manager to maintain the entire structure at minimum cost. If, at a later date, the company found a need for additional space, it could be readily made available and in the meantime, storage needs of the Army Air Forces would be satisfied and space would be provided for the preservation of general purpose machine tools with which the plant or other aircraft plants could be activated in an emergency."

Transition Period for Priority Scrapping

The War Production Board has ordered the gradual scrapping of priority control for "virtually everything except military requirements", over a six-month period. The six-months' transition from July 1 to December 31 is to let business adjust itself to a new system which will go into effect January 1, 1946. The present AA rating system will continue through 1945, being replaced by a system of AAA ratings for emergencies and a new MM rating for assignment by military agencies for emergencies only. The end of the year will also bring an end to the controlled materials plan under which metals are rationed to authorized users.



SEGREGATION OF PARCELS BY DESTINATION and loading in non-stretch nets has enabled Navy crews to load new 72½-ton Martin JRM Mars with cargo in one hour, and unload it in thirty minutes. Nets are spread on oblong wooden flats before parcels loaded and ropes through eyelet corners are drawn to tightly net the bundle. Cargo hoist built into the Mars wing picks up net, leaving wooden flat on mechanical mule.
—(Glenn L. Martin Photo.)

Sixty-Hour Week for Ryan Workers

Ryan Aeronautical Company has instituted a sixty-hour work week for final assembly workers to meet a shortage of skilled manpower, and to meet Navy requests for more Ryan fighting planes. The longer work day for the workers is a temporary measure, designed to meet the shortage, and will be discontinued as soon as sufficient skilled labor can be recruited.

Dallas Plant Finishes First C-82 Packet Ahead of Schedule

North American Aviation, Inc., of Dallas has completed the first of a large order of Fairchild C-82 Packet transports thirty days ahead of schedule, and production is being accelerated daily. Besides producing the first model ahead of schedule, the plant incorporated into it many changes ordered following Wright Field test. Dallas' second and third C-82's will be completed during the coming weeks. Robert McCulloch is plant manager.

Last B-17 Delivered; Boeing Built 6,981, Douglas 3,000, Lockheed 2,750

The 12,731st Boeing B-17 was delivered last month to the AAF by Lockheed Aircraft Corp., ending production of the most famous bomber of the air.

Boeing, which developed the design for the plane, built 6,981 B-17's, ending its production in April, 1945, to concentrate on production of the B-29 Superfortress. Douglas built 3,000 Flying Fortresses at its Long Beach plant and Lockheed built 2,750 B-17's.

This production pool, instituted in July, 1941, was one of the first wartime examples of industrial teamwork. During the peak period of B-17 deliveries, more than 250,000 men and women were employed in the Fortress program, including those building engines, subassemblies and parts throughout the country.

The newest aircraft production pool is the B-29 joint program, in which the Boeing Superfortress is rolling from the factories of Boeing, at Seattle-Renton and Wichita, Bell in Georgia, and Martin in Nebraska.

Hamilton Standard's New Four-Blade Prop on Improved F4U-4 Corsair

A new four-bladed Hamilton standard propeller, designed to absorb higher horsepower at high altitudes, is helping the performance of the Chance Vought F4U-4 Corsair. Previous models of the Corsair were equipped with three-bladed propellers. Retaining the 13 feet 2 inch diameter of the three-bladed propeller used on the F4U-1, the new propeller also uses the same NACA airfoil in its blades.

Midwest Is Center for Plane Modification

The Midwest district of the Air Technical Service Command is performing 37 per cent of all modifications on tactical aircraft, according to Brig. Gen. Ray G. Harris, commanding general. During June, 343 military airplanes were modified by six centers in the Midwest, including Lockheed Modification Center at Dallas. Modifications are currently being executed throughout the Midwest area on B-17's, B-24's, B-29's, A-20's, A-26's, P-38's and P-80's. One conversion is the B-29 into the F-13 photographic-reconnaissance ship.

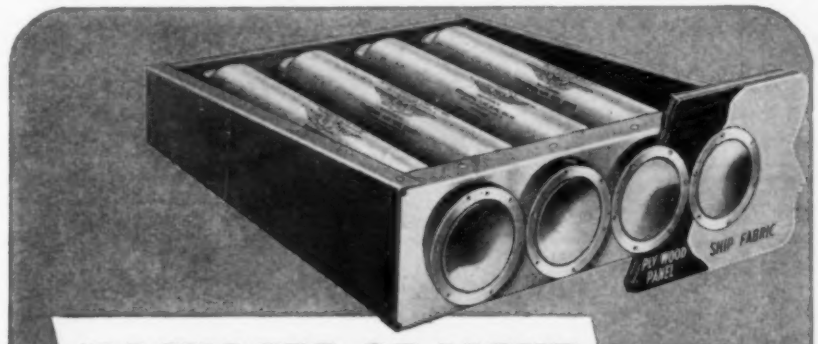
Four DC-3's Completed by Globe Aircraft

Globe Aircraft Company, Fort Worth, has completed four change-over planes as one of four Douglas-authorized conversion and overhaul centers. Globe is also readying two DC-3's for a delivery flight by Douglas pilots from Fort Worth to Honolulu for Hawaiian Airlines. These conversions include installing cabin fuel tanks, navigation instruments, and extra radio and emergency safety provisions such as life rafts and flares.

$2,500,000 Fund for Production Record Sought by Air League

The Air Power League has launched a nation-wide program to promote adequate production research in aviation in order that American leadership will be maintained after the war. The program is to be implemented by a $2,500,000 fund which is to be sought from corporations and individuals, according to Charles E. Wilson, president of General Electric Co. and of the Air Power League.

NEW VOUGHT CORSAIR F4U-4 is powered by 2,100-hp. Pratt & Whitney R-2800C engine. First carrier plane to use the "C" engine's higher power, it is in the 425-mph. class.



PACKAGES OF LIGHT AT YOUR FINGER TIP

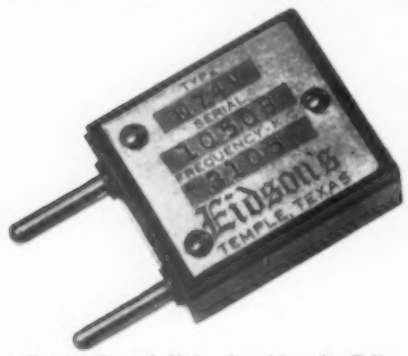
INTERNATIONAL Parachute Flares have long been standard equipment on commercial and private planes. Throughout the war practically every plane has carried International's to light operations, guide it to safe landings. Every pilot will want this extra degree of safety on his plane of the future.

TYPICAL INSTALLATION of a group of **INTERNATIONAL** 1½ Minute Parachute Flares. Electrically operated from a special switch in the cockpit, these flares can be expelled, one at a time, as needed. Supplied with brackets, one up to five units, in one to three minute types.

Write for New Catalog

INTERNATIONAL FLARE-SIGNAL DIV.

of THE KILGORE MFG. CO. *Tipp City, Ohio*



- Quartz Crystal Units for Aircraft, Police, Marine, Geophysical and other services.
- Let us supply your requirements, large or small. Send for folder L-5, mention your needs. Many types available.
- Crystal repair and regrinding.
- "Ten Years of Satisfaction and Fast Service."
- We are as near as your telephone.

"EIDSON'S"

1309 N. 2nd St., Temple, Texas. Phone 3901

Willow Run Built 8,685 B-24's Before Closing

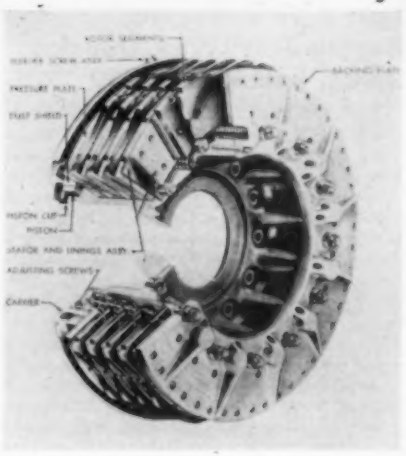
The last Ford-built B-24 Liberator has been produced at the Willow Run bomber plant. Total output for the plant reached 8,685 planes, valued at $1,500,000,000.

Dual Tires Favored for Airplane Use

From studies of the performance of dual tires for aircraft, combined with knowledge of their extensive adoption for trucks and buses, tire engineers at B. F. Goodrich agree that duals should be favored for air use. Reasons for desiring duals are for greater safety, less chance of damage in event of blowout, wheel changes are easier, weight saving, better distribution of loads on runway and lower tire and tube cost.

New Harvill Plant

Harvill Corporation, California, has announced an establishment of a branch plant in Fall River, Massachusetts. The new plant, comprising 9,000 square feet, will handle all types of die casting, finishing and machining. Surplus equipment from the California plant has been converted and rebuilt to meet requirements of Eastern orders.



NEW SEGMENTED rotor disc brake design now in production by Bendix Products Division of Bendix Aviation Corp., saves as much as 500 pounds on large new experimental bombers. The rotor disc assembly consist of three major parts — main carrier structure, containing a hydraulic pressure chamber, piston and hydraulic seal; lining carrier members loosely keyed to brake carrier, and heat absorbing elements called "rotors," segmented instead of being rings.

18 pc. UNIVERSAL MIDGET AIRCRAFT ¼" SOCKET SET. 8 sockets—7/32" to 7/16", Spin-type Handle, Sliding T Bar Handle, Reversible Ratchet, Midget Crescent Wrench, 4 Midget Open-End Wrenches, 1 Midget Screwholder . . . $19.85.

UNIVERSAL TOOL COMPANY
1527 Grand SFS, Kansas City, Mo.

On their Way again to Win again!

Are You?

Today veterans of our European victories are sailing to final triumph in the Pacific! Meanwhile American industry is following a full-speed program to hasten peace through the Payroll Savings Plan!

From coast to coast, veteran Bond salesmen are again mustered into service for plant-wide selective resolicitation campaigns, designed to:

★ Hold all new 7th War Loan subscribers on Payroll Savings Plan books, maintaining or increasing present allotments —

★ and convince all regular subscribers, who recently stepped up their Bond buying, of the advantages of continuing on this patriotic, save-more basis.

Back up our fighting men who have won one war—and are out to win another! Use selective resolicitation to step up your Payroll Savings Plan—tighten the rein on inflationary tendencies—build peacetime prosperity.

The Treasury Department acknowledges with appreciation the publication of this message by

Southern Flight

This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council

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Playing for "KEEPS"

DOAK AIRCRAFT CO., INC.

Aircraft is basic business with Doak. We are not merely "converted" for the duration so we do not intend to reconvert. Ours is a complete metal-working factory set up for the purpose of producing aircraft parts and assemblies . . . having all necessary departments to do the entire job right in the plant. So we are in aviation for "keeps" . . . and invite continuous aircraft assignments. Doak Aircraft Company, Inc., Torrance, Calif.

MANUFACTURERS OF COMPLETE AIRCRAFT ASSEMBLIES

PERSONALS

WILLIAM A. DeRIDDER has been elected president and general manager of Adel Precision Products Corp., succeeding Ray Ellinwood, resigned. He has been an Adel director since January, 1943, and is president of General Metals Corp., in addition to his being Adel president. . . . ALAN G. BINNIE has been named assistant general manager and PHILIP F. WEBER has been appointed factory manager in charge of all manufacturing operations at the two plants of Kollsman Instrument Division of Square D Company. Binnie was in engineering sales and service and foreign sales for Kollsman; Weber was assistant chief engineer and sub-contracting supervisor. . . . G. A. HYLAND has been appointed sales manager of the new Westinghouse Aviation Gas Turbine Division, succeeding W. F. Boyle who resigned. Westinghouse also announced the appointment of WILLIAM A. MECHESNEY as manager of the contract negotiation department for the same division.

ALLEN W. SCHMIDT has been appointed sales promotion manager of Kelite Products, Inc. He was formerly production man of promotional and technical literature for Little & Company. . . . W. W. (WICK) FOSTER has been named sales manager for the Southwest region for Plomb Tool Company, with territory including California, Western Nevada, Arizona and New Mexico. . . . GARRARD MOUNTJOY has been advanced to take charge of all research and development work in the New York laboratories of Lear, Incorporated. He was in charge of research and development in the radio division of Lear. . . . H. T. SAGERT has been appointed chief of aircraft radio customers service for Lear, Incorporated.

D. C. KILGOUR has been appointed general superintendent of Globe Aircraft Corporation, Fort Worth. Kilgour was a former production executive of Consolidated Vultee and North American Aviation, Inc. . . . H. F. HARGROVE has been named works manager of Consolidated Vultee Aircraft Corporation's Fort Worth division, succeeding C. A. Sharpe. . . . RAY W. COLE, former controller of Consolidated Vultee Aircraft Corporation's Miami division, has been appointed controller of the Louisville division. . . . HOWARD L. HARTMAN was named assistant director of contract termination of United Aircraft Corporation. He was formerly executive assistant to Rex B. Beisel, general manager of Chance Vought.

GUNNAR EDENQUIST has become assistant to the president of Pacific Airmotive Corporation. Edenquist was vice president and a director of Kinner Motors, Inc., before becoming an officer at Pacific Airmotive. . . . E. O. LOCHER has been named vice president and in charge of all branches of Pacific Airmotive Corporation. He has been with the corporation since 1937. . . . C. RICHARD CHALLINOR has been named aviation commissioner of the Kansas City Chamber of Commerce, succeeding Richard C. Murray, who resigned. Challinor was formerly with the Aluminum Company of America.

THOMAS B. DOE, JR., has been appointed manager of the aircraft equipment sales division of Vickers, Incorporated. . . . MAJOR RICHARD SCHALL, Air Corps, has been released from active duty to resume his work with the Civil Aeronautics Administration as chief of the foreign operations division. His former work with CAA was in the scheduled air transportation field. . . . JOHN A. RUTHVEN, former West Coast manager of Cleveland Pneumatic Tool Company, has been appointed manager of Aircraft Tool Company, a new organization for sales and distribution of Aircraft Tools, Inc., products. . . . HAROLD DELLETT, formerly assistant production control manager of Aircraft Tools, Inc., has been placed in charge of the South Central area with offices in Wichita and Dallas. . . . JACK ANDERSON, formerly with Douglas Aircraft, has been retained by the Curtiss-Wright Corporation as public relations representative on the West Coast.

J. B. Walker Opens Public Relations Firm

John B. Walker has resigned as vice president of Aireon Manufacturing Corporation to head his own firm, John B. Walker and Associates, public relations counsel, with offices at 60 East 42nd St., New York City. Walker has also acquired control of Relamex, S. A., a public relations firm in Mexico City, and will co-ordinate its services with those of his New York organization. To public relations, Walker brings a varied background of sales, advertising, promotion and publicity experience.

C-W Shifts Executives

Executive reassignments as the result of the adjustment and reallocation of schedules at Curtiss-Wright's Airplane division have been announced as follows: Nathan F. Vanderlipp, general manager of the Buffalo plant, becomes executive engineer for the airplane division, supervising all engineering operations in the Columbus, Ohio, Buffalo and Kenmore, N. Y., plants; George A. Page, Jr., airplane division director of engineering, is to concentrate on refinement of the CW-20E Commando, Vanderlipp's new assignment freeing Page of many of the technical and manufacturing details in the engineering branch; and John J. Lee, general manager of the Kenmore plant, becomes general manager of the Buffalo and Kenmore plants.

Vanderlipp Lee

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Complete Line of Self-Cleaning and Tubular Punches and Steel Rule Dies for cutting gaskets, cloth, leather and wood parts, etc.
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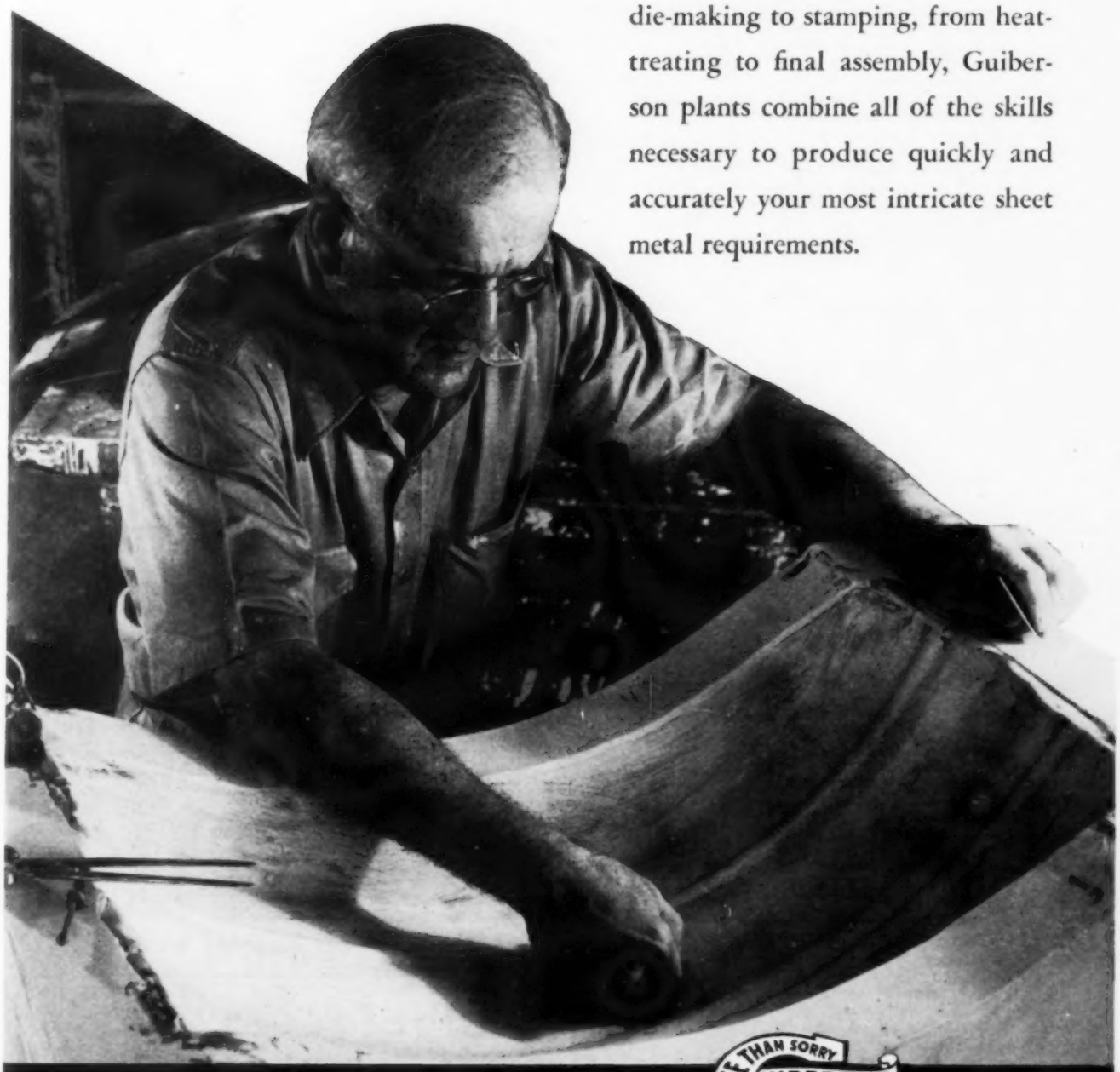
Kansas City, Missouri

Guiberson U.S.A.

From drawing to mock-up, from die-making to stamping, from heat-treating to final assembly, Guiberson plants combine all of the skills necessary to produce quickly and accurately your most intricate sheet metal requirements.



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THE GUIBERSON CORPORATION
GUIBERSON DIESEL ENGINE CO.
Dallas, Texas

ESTABLISHED 1919

Producers of Oil Tools, Light Weight Air-Cooled Diesel Engines, Sheet Metal Parts and Heating Units.

AIR TRANSPORT

Examiners Favor United for Service to Hawaii

By E. H. PICKERING

CAB Examiners Tom Wrenn and Lawrence Kosters have recommended that United Air Lines be extended to Hawaii in competition with PAA. They recommended against the applications of Western, Northwest, Matson, Hawaiian, and Ryan. The Examiners pointed out that such an extension would help to restore a competitive balance between the "Big Three" transcontinental lines. If the Board upholds the Examiners' recommendation, United will serve Hawaii from both Los Angeles and San Francisco.

Earlier in the month, the long-awaited decision of the North Atlantic case was announced with presidential approval granting Pan-American, TWA, and American Export routes into and through Europe. Approval of the purchase of American Export by American Airlines was granted.

Non-Scheduled Carriers Probed

Additional developments of interest for non-scheduled air carriers took place in July when CAB ordered a complete economic investigation of Trans-Marine Airlines, Inc., following a protest by Northeast Airlines alleging that Trans-Marine was in reality conducting a scheduled service, although the operation is described by its owners as non-scheduled. This would be in violation of the Civil Aeronautics Act as no approval by the CAB had been granted for such operation. This is the second such case now under CAB investigation, the first concerning Page Airways, which was ordered following a crash of a Page Lodestar at Washington National Airport several months ago. Trans-Marine is conducting operations between New York and coastal and island points off Rhode Island and Massachusetts.

160,000 Carrier Personnel in 1950?

Study by the Bureau of Labor Statistics indicates a maximum air transport employment of 160,000 five years after the war. Possible minimum employment would be half that large. Considering that over 200,000 pilots have been trained by military, in addition to several times that number of ground technicians, this would indicate that the airlines would be in a position to choose carefully their new employees and many an ATC member seeking employment in air transport after the war will be disappointed.

Helicopter Transports Expected

Speakers at the Air Transport Users conference, sponsored by the NAA in Washington early in July, discussed all phases of air transportation business, present and future. Of special interest were the remarks of L. C. Peskin, Manager of Contracts Division of Kellett Aircraft Corporation, concerning transport possibilities of the helicopter, whose development already shows a ratio of useful load to gross of 30 per cent. This is closely approximating many standard transport models of conventional aircraft today. Peskin added that ratios of 50 per cent of gross load useful are already in the design stage. He added that there is nothing in the design of a helicopter which would prohibit production cost from being in line with conventional aircraft.

Paul M. Brown, General Traffic Manager of Sears-Roebuck & Company, representing what is expected to be a large user of air cargo, suggested that air freight rate schedules be maintained as simple as possible. "We feel it is important that air transport companies do not prepare tariffs as complicated and as difficult to interpret as some of our present-day rail tariffs," he said. He suggested a sliding scale of volume rates, in order to encourage consolidation of small shipments for more economical handling, and requested airport-to-airport rates in addition to door-to-door rates, in order that large shippers could take advantage of resulting cost savings. It is interesting to note here that recent experimental air freight rates set forth by TWA for its new cargo service makes this provision.

C-47, C-54 Costs

Present cost to the Air Transport Command for C-47's is $92,970, some $38,060 less than the cost of the first C-47's. C-54's, originally $539,546, are now down to $290,118, according to Colonel James W. Aston, Assistant Chief of Staff, Air Transport Command. These prices give some indication of what direct-from-production-line equipment may cost the airlines in the near future.

Domestic

United Airlines' Charles T. Wrightson is the first man in the industry to complete a thirty-year continuous service with a single airline. He is station manager at Los Angeles. Wrightson started with Barney Airlines, United's predecessor.

Braniff Airways has inaugurated service into Lubbock, Texas, on its Dallas to Denver operations. Braniff will begin operation on its new Oklahoma City-Memphis route about September first. Service on this route is authorized into Tulsa and Muskogee, Oklahoma, Fort Smith and Little Rock in Arkansas.

U. S. AIRLINES PLAN 1946-47 FLEET OF 975 TRANSPORTS

An Air Transport Association survey of the nineteen U. S. Airlines indicates $750,000,000 will be spent on new air and ground equipment in the next five years. A total of 409 transports now on order will add 23,275 seats to the fleet of 564 planes and 11,839 seats available for operation at the present time. The projected 1946-47 fleet of 975 transports, having 36,180 seats, will be nearly three times larger than that of 1941, when 359 planes with 6,250 seats were available, but its seating capacity will be almost six times larger. At present 564 transports having 11,839 seats are operated by the airlines, but 169 of them are in foreign service.

In table form the ATA sets up the airline program as follows:

Airline		1940 High	1943 Low	1945 High	On Order	1946-1947
American	Planes	81	43	100	55	160
	Seats	1561	903	2460	3000	6240
American Export	Planes	....	....	18	6	24
	Seats	....	....	378	360	738
Braniff	Planes	14	7	15	7	22
	Seats	234	125	315	147	562
Chicago & Southern	Planes	7	4	10	9	19
	Seats	114	77	210	246	456
Colonial	Planes	4	2	4	5	9
	Seats	77	40	84	105	180
Continental	Planes	5	3	6	8	14
	Seats	41	36	105	168	273
Delta	Planes	8	4	10	15	25
	Seats	98	91	210	470	680
Eastern	Planes	30	20	43	42	85
	Seats	543	400	903	1820	2723
Inland	Planes	6	3	3	*	*
	Seats	56	34	48	*	*
Mid-Continent	Planes	7	4	8	4	12
	Seats	73	53	147	84	231
National	Planes	6	3	13	10	23
	Seats	68	42	182	410	592
Northeast	Planes	6	2	6	9	15
	Seats	65	42	138	540	678
Northwest	Planes	16	8	17	32	49
	Seats	320	145	357	1280	1637
Pan-American†	Planes	122	148	130	61	191
	Seats	2304	3009	2765	8428	11,183
Pan-American Grace	Planes	12	15	21	3	24
	Seats	216	280	371	153	677
P C A	Planes	19	6	20	25	45
	Seats	333	126	420	1000	1420
T W A	Planes	42	25	60	58	118
	Seats	851	525	1345	2244	3589
United	Planes	70	33	66	50	116
	Seats	1185	597	1121	2350	3471
Western	Planes	11	4	14	10	24
	Seats	173	80	280	470	850
Totals	Planes	466	334	564	409	975
	Seats	8312	6605	11,839	23,275	36,180

*Included in Western.
†Including subsidiaries except Panagra and CNAC.

NEW PRODUCTS

Plastic Protectors

Plastic pipe seals and thread protectors in countersunk pattern have been announced by American Molded Products Company. Due to demand for the countersunk type, this addition to the line now gives users a choice, the squarehead patterns still being available. The strength and lightness, as well as the toughness of plastic, make it preferred material for pipe seals and thread protectors. The square sockets of American Molded's new countersunk pattern are of dimensions to fit commercial square bars of standard sizes. Further information may be obtained on request.

Pressure Transmitter

Trimount Instrument Company has announced a pressure transmitter, making possible for the first time the recording of pressures on any continuous balance potentiometer. The instrument simplifies many pressure transmission problems and makes possible many studies heretofore impossible. More than one pressure can be recorded on the same instrument by means of a special switching arrangement. Installation of the instrument is simple. Size and weight are small, and it is available for any type pipe fittings. The transmitter is usable for gases or liquids for pressures up to 1,000 p. s. i. It has wide temperature range, and no amplification is required. Further information is available on request.

Compact Power Unit

Island Equipment Corporation, New York, is producing a unit known as "Power-Pac" to meet the demand for an efficient power unit for motorizing conveying equipment. It is a self-contained assembled unit, and can be quickly and securely bolted to the chassis of any piece of conveying equipment that needs to be mechanically operated. The unit consists of motor, driving rods, switch speed reducers, controls and proper gears.

New Motor for Actuation

New cowl flap actuating motor made by Electrical Engineering and Manufacturing Corporation is designed for cowl flap actuation on the Douglas A-26 attack bomber, and custom built parts to fit awkward mounting conditions and limited space. The unit consists of a 1/6 hp. motor. It is equipped with magnetic clutch and brake, and straight eight to one gear reduction is provided for opening and closing flaps, with double reduction and worm drive to operate cams limiting travel of flaps.

Foamite for Oil Fires

American-La France-Foamite Corporation is manufacturing a forty-gallon engine for extinguishing hot oil fires without danger of reflash. The engine, the Foamite Challenger, produces 50 per cent more foam than any other type of its kind designed; it delivers it in three minutes. The Challenger is approved by both Underwriters and Factory Mutual Laboratories, and is now in production. Literature is available on request.

New Line of Tools, Gauges

A complete line of machinist tools and gauges is being manufactured by the Products Engineering Company, Beverly Hills, California, identified with the manufacture of aircraft production and maintenance tools and equipment. The new line includes depth micrometers, surface gauges, screw pitch gauges, thickness gauges, engineers' gauges including wire, thickness and taper blades, and drill and wire gauges. They are available from stock and through distributors.

New Flux for Welding

An improved free-flowing flux for the gas welding of aluminum and aluminum alloys, is now being manufactured by A. K. Mauk, 7607 Hamilton Avenue, Pittsburgh 8, Pa. Known as "Flo-Well," it is used to gas-weld wrought, cast or high tensile aluminum and aluminum alloys, of any size or shape, wherever welding is possible. As a result of improved methods of manufacture, Flo-Well will not solidify or deteriorate and can be easily applied by inexperienced welders. Widely used by the aviation and other industries, it is packaged in 1/4-lb. to 25-lb. glass containers to protect the flux from moisture. Free samples, and instructions for use of this flux, will be forwarded by the manufacturer upon request.

Heat Resistant Rubber Hose

A new synthetic rubber hose, which offers increased resistance to heat and pressure, has been perfected by United States Rubber Company to withstand temperatures up to 250 degrees Fahrenheit for use in oil lines and up to 300 degrees for installation in cooling systems. Resistance to pressure in hose one inch in diameter is double that of hose formerly used. The strength is increased proportionately in the other sizes, ranging from one-quarter inch to two and one-half inches in diameter. Use of the hose reduces danger of engine trouble from faulty lubrication and cooling. Maintenance costs and manhours are saved because replacement is required less frequently. One of the principal features of construction is a new high-strength carcass built with Ustex, a chemically-treated cotton yarn which is much stronger than regular untreated cotton yarn. Special heat-resistant synthetic rubber was perfected after extensive research and experimentation in the United States Rubber Company's laboratories.

Turnbuckle Adjustment Set

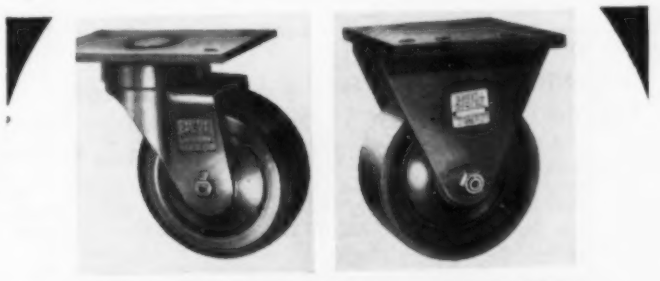
A new turnbuckle adjustment set has been announced by Aero Tool Company of Burbank, California. The set consists of a turnbuckle wrench and two V-shaped retainers which are connected by a twelve-inch length of link chain. When the retainers are dropped over the swedged-cable fitting, converging "steps" in the retainers find their own adjustment automatically on any fitting from 3/16-inch to 11/16-inch in diameter—the weight of the chain holding them in position, although a set-screw is provided for use when needed. The chain acts as a rigid bar against the simultaneous clockwise and counter-clockwise torque of the swedged cable fitting set up when the turnbuckle is turned—while its vertical flexibility permits adequate clearance in the tight spots. The turnbuckle wrench is self-adjusting and its grasping surfaces cannot scratch or mar the turnbuckle. The grip automatically tightens as the wrench handle is pressed down — automatically releases and slides smoothly around the turnbuckle to a new grasping position when the handle is raised.

Valve for Park Brakes

Installed in the hydraulic line between each master cylinder and brake assembly, the new patented Scott Model 4200 Parking Valve provides parking brakes on any aircraft equipped with hydraulic brakes. Its unique construction seals in the pressure for a long period of time. The design is simple with only two moving parts and should last as long as the airplane. Parking brakes contribute to greater safety of pilot, service personnel and to the airplane itself. Complete information is available from any Scott Chartered Dealer or from the Scott Aviation Corp., Lancaster, New York.

New Type Anchor Nut

A new type of floating anchor nut, developed by Kaynar Manufacturing Co., 820 East 16th Street, Los Angeles, employs replaceable standard nuts. It is available in sizes from No. 6-32 to 3/8-in-24. The unit consists of base, retainer, standard nut, and a patented steel spring clip, all assembled. The clip holds the nut securely in place, but can be easily disengaged by prying up with a screwdriver, permitting quick replacement of damaged nuts, without special tools and without need of drilling out rivets. The nut floats in all directions, insuring self-alignment of nuts with the bolt axis. The base is fabricated from high strength ST aluminum and has high resistance to torque and thrust. Flanges will not bend and nuts cannot be pushed out. It can be used with high temperature nuts, up to 650 degrees F.



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KEEP TURNING AND EARNING

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New Alabama Legislation Includes Modified Form of NARUC Bill and NASAO Recommendations for Code

The Alabama legislature, which accepted the argument of surface carriers and utility companies despite its generally liberal attitude toward aviation, has passed a version of the NARUC bill. Aviation interests secured modifications of the bill which limit its application to charter service only, and were instrumental in securing passage of three other laws favorable to air development in the state.

Amendments were incorporated in the NARUC bill before passage removing the intra-state portions of inter-state air lines from control of the Public Service Commission. An executive amendment specified that the Public Service Commission could not exercise restriction over any form of aircraft service operations except charter flying.

All principles of the National Association of State Aviation Officials as expressed in the NASAO code are incorporated in the other major legislation, which sets up a State Department of Aeronautics. The department will be administered by a seven-man Aeronautics Commission consisting of the Director of the State Highway Department, the Director of Public Safety and five other members appointed for staggered terms. The Aeronautics Commission succeeds the Aviation Commission under which state programs have been administered.

Action on one of the most important potential activities will be delayed until after the next general election in November, 1946. This is a constitutional amendment authorizing the state to expend its funds on the construction and maintenance of publicly owned airports and other air navigation facilities.

Revenue from aviation gasoline taxes are allocated to the development of aviation in another bill. Municipalities will share in the funds, getting 25 per cent of the first $12,500 in gas revenues each quarter-fiscal year in their county; 15 per cent of the second $12,500 and 5 per cent of all above $25,000. All other funds go directly to the state aeronautics department. This revenue, at both state and local levels, can be used only for the acquisition, engineering, construction, improvement and maintenance of airports and other air navigation facilities.

Luscombe Moving Sales Force to Dallas as New Buildings Finished

Two hangar units have been about two-thirds completed on the site acquired early this year by Luscombe Airplane Corporation near Dallas for development into a model personal plane manufacturing, servicing and operating center, it has been announced by Leopold H. P. Klotz, president. This site is about nine miles northeast of downtown Dallas.

Preparations are being made to set up the interior partitions for office and shop areas and to pour cement for the main floors. A part of the company's servicing operations has already been moved into the first hangar to be built, and as war commitments permit, parts for the Silvaire are being fabricated at a rate to assure adequate servicing of aircraft now in the field and to anticipate future requirements.

The company's sales department is scheduled to be moved to Dallas in August or September.

Meanwhile war work and preparations for civil aircraft construction continue at the factory leased some months ago in downtown Dallas, and the company's three Trenton, New Jersey, plants are working at full capacity on the production of all-metal components for military aircraft.

While no definite schedule for civil aircraft production by Luscombe can be given at the present time because of the company's policy of placing war work first, Mr. Klotz stated that manufacture of the well known all-metal Silvaires will not lag behind the production by other personal plane manufacturers.

Regional CAA Advisers To Aid Private Flying

CAA has appointed four regional adviser-consultants to implement its policy of aiding and promoting the advancement of private flying, according to T. P. Wright. The appointments are Roland Rohlfs for Region 1, Carl W. Clifford for Region 2, Marshall E. Beeman for Region 6 and Lester B. Littrell for Region 5. The men are certificated pilots and were members of the staffs of the Civilian Pilot Training Program and the War Training Service. They will aid in the organization of flying clubs, advise in the acquisition of airplanes, and suggest aerial tours with a view to increasing the usefulness and enjoyment of flying private aircraft.

Supersonic Tunnel Used to Study Jet Speeds Over 2,000 Mph.

Fundamental research on aircraft propulsion plants operating at equivalent sea level velocities up to and beyond 2,000 miles per hour is now being conducted in a new type of supersonic wind tunnel recently completed at the National Advisory Committee for Aeronautics aircraft propulsion research laboratory in Cleveland.

The new NACA wind tunnel is a unique research facility for investigating at supersonic velocity the operating characteristics of models of turbo jet, ram jet, and similar engines expected to propel aircraft and guided missiles through space at speeds hitherto unrealized except by projectiles shot from guns.

The tunnel has a cross section of two and a quarter square feet, through which air moves at extremely high speed. In the tunnel the model propulsion device is mounted in such a way as to measure the aerodynamic forces on it, as well as the thrust developed. Complete instrumentation is provided to determine performance characteristics with various fuels at different speeds and other operting conditions.

Dr. George W. Lewis, Director of Aeronautical Research of the NACA, in discussing the application of the new Cleveland tunnel, revealed that many of the projected propulsion systems should have sufficient thrust to take aircraft well into the supersonic speed range. Those which depend on outside air for combustion, such as turbo jets and ram jets, must handle vast amounts of air at such high speeds as to change entirely the nature of air flow as we now know it.

General Tire Plans National Program for Accessories Merchandising

The General Tire and Rubber Company is perfecting a distribution plan to cover the entire country. To aid distributors, a complete merchandising and promotional program has been worked out. Display stands for all sizes of airplane tires and cabinet to house the accessories has been designed for distribution outlets. Window displays, indentification signs, special stationery and local advertising suggestions are included. Other accessories are to be added as materials are made available for civilians. General Tire also has a complete line of wheels and brakes and tail wheels as a part of its aviation program.

Aero Chamber Releases Air Parts Blue Book

The second edition of the "Blue Book of Airplane Parts", a comprehensive volume for use in billing shipments, has been distributed by the Traffic Service of the Aircraft Industries Association (Aeronautical Chamber of Commerce). The book gives permissible freight classifications for aircraft materials, resulting in savings of as much as 53 per cent in freight charges. The new edition is in loose-leaf form permitting constant revision.

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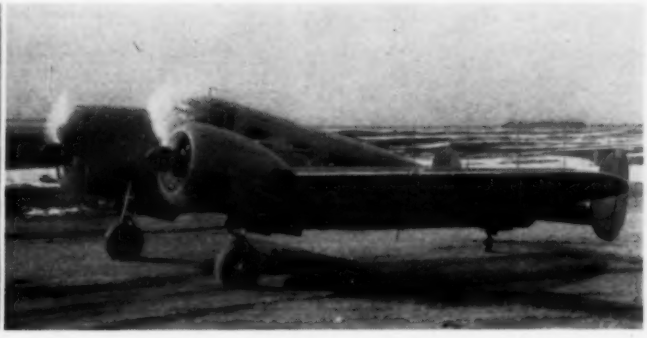

Beechcraft 18-S

BEECHCRAFT D-17-S 5-place 1943, N. C. 51121, Pratt & Whitney Wasp, total time 1,047 hours ship; engine 576. Five hours since major overhaul; metalized cylinders; constant speed prop. Fresh 100-hour check. New hand-rubbed finish, insignia blue with white Beech stripe; new upholstering. All instruments including Gyro compass and artificial horizon, 5 gas tanks total 121 gals. Bendix 3-band civilian radio, 20 watt transmitter, radio direction finder, Lux Fire Fyter system and many other desirable features. Believe this is the best ship of its type in the country.

BEECHCRAFT D-17-S 5 place 1943. Pratt & Whitney same as above except ship has 690 hours total time and 138 hours since major overhaul on motor.

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BOOK REVIEWS

Your Personal Plane, *by John Paul Andrews, published by Duell, Sloan & Pearce, Inc., 270 Madison Avenue, New York 16, N. Y., price 2.50.*

Intended for "the thousands of people who are planning or hoping to own a private plane," this book seeks to introduce prewar and postwar models of well known lightplanes in a conversational way devoid of technical matters and pilot talk. It was obviously written and published to focus bookstore attention on the personal airplane while the public is clamoring and the opportunity is ripest.

American Air Navigator, *by Charles Mattingly, published by Ziff-Davis Publishing Company, 350 Fifth Ave., New York 1, N. Y., price $6.00.*

Charles Mattingly is Chief Navigator, Consolidated Vultee Aircraft Corporation. With a background of twelve years of actual experience as a navigator, both surface and aerial, the author has seen the need for a book which separates practical, applicable information from the field of theory. This comprehensive, elaborately illustrated volume is the result. Intended primarily for the serious student of aerial navigation, it is both a training text for instructional purposes and a reference source for professional navigators.

Meteorology for Pilots, *by Robert W. Mudge, published by McGraw-Hill Book Company, 330 West 42nd St., New York 18, N. Y., price $3.00.*

Written for pilots, the book explains why phenomena occur, gives specific suggestions for flying various kinds of weather, and discusses the interpretation and use of weather information for flight planning. The use of formulas has been avoided. At the same time, all the necessary theory is included, interwoven with practice. Illustrated with numerous charts, photographs and diagrams; 259 pages.

SAE Handbook, 1945 Edition, *published by the Society of Automotive Engineers, 29 West 39th St., New York 18, N. Y.,* price $5.00 per copy to non-members.

The 620 pages of text contain all SAE official current standards and recommended practices, except those which are aeronautical, plus general data having important bearing upon both standard and recommended practices. The new volume supersedes all earlier editions.

NEW LITERATURE

Arens Controls, Inc., 2253 S. *Halstead Street, Chicago 8, Ill.,* has announced the release of a new engineering bulletin describing its new Tension Lock Control, designed for positive locking on difficult control jobs. Ask for Bulletin No. 10.

Aircraft Screw Products Company, Inc., 47-23 *35th St., Long Island City 1, N. Y.,* has issued its latest bulletin No. 242, describing the "Aero-Thread" Screw Thread System and giving design and installation data.

Ampco Metal, Inc., 1745 S. *38th St., Milwaukee, Wis.,* has published a comprehensive, illustrated booklet prepared to help industry discover wherein the Ampco organization of metallurgical specialists can be of service. It is titled "Bulletin 71 Institutional Book."

Products Engineering Company, 9045 *Wilshire Blvd., Beverly Hills, Calif.,* has issued new literature covering its line of the following tools: Self-Adjusting Toggle Clamps, A.S.A. Drill Bushings, Machinists Tools and Gauges which include Depth Micrometers, Surface Gauges, Screw Pitch Gauges, etc. This company also has compiled and printed a complete but simplified Jig Drill Bushing Conversion Data Chart.

Pan-American Navigation Service, 12021 *Ventura Blvd., North Hollywood, Calif.,* has announced that its new catalog of aeronautical and navigational equipment is now ready. Free on request.

The B. F. Goodrich Company, *Akron, Ohio,* has published a new four-page folder on its pressure sealing zipper for aeronautical applications under the title "New Openings for Tomorrow's Aviation." Available upon request.

The new zipper is an ingenious rubber construction applied to metal sliding fasteners which will not allow gases or liquids to pass, even under high pressure. Various types are pictured, and applications in the aviation field listed.

W. C. Dillon & Co., Inc., 5410 *West Harrison St., Chicago 44, Ill.,* has published a complete presentation in manual form of the story of the traction type dynamometer and the constantly increasing number of uses which are being found for it in simplifying testing and weighing procedures.

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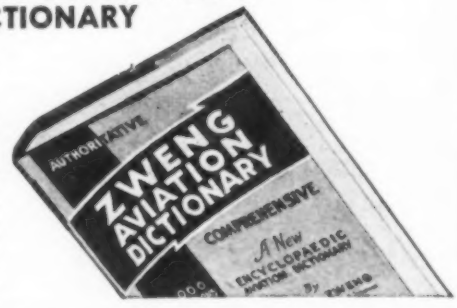

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MANUAL OF THE E-6B COMPUTOR (New) by Allan C. Zweng. An essential text for every airman and Instructor. De Luxe Edition, $2.00.

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Pocket Pamphlet of New Air Regulations Published by UPMA

United Pilots & Mechanics Association has just issued a pocket size booklet containing the new, simplified Parts 20, 43 and 60 of the Civil Air Regulations. It also includes four pages of heretofore unpublished information titled "Things Every Pilot Should Know" which are the result of research and study for more than a year of administrative practices of CAA and decisions of the Civil Aeronautics Board.

In addition to the new regulations, it includes specific instructions on what to do in case of accident, rules regarding removal of wreckage, transportation of explosives, procedure to be followed in cases involving violations of Civil Air Regulations, surrender of licenses, hearings following denial of medical certificates, re-examination of pilots and mechanics for competency to hold their ratings and instructions for registration of aircraft.

Copies are being distributed free to all members of UP&MA and are being placed on sale to the public through the Washington office, fixed-base operators and dealers throughout the nation.

As part of a vigorous campaign to educate the flying public regarding its privileges and responsibilities in aviation, the booklet is intended to place at the constant disposal of each pilot and operator the regulations which he is expected to obey, as well as necessary information for use under certain emergencies which may arise.

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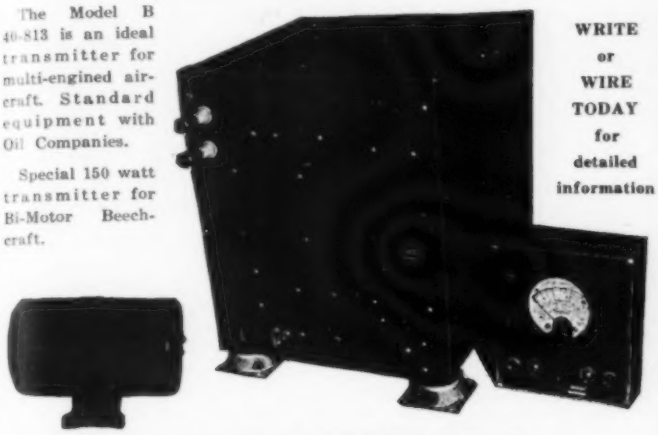

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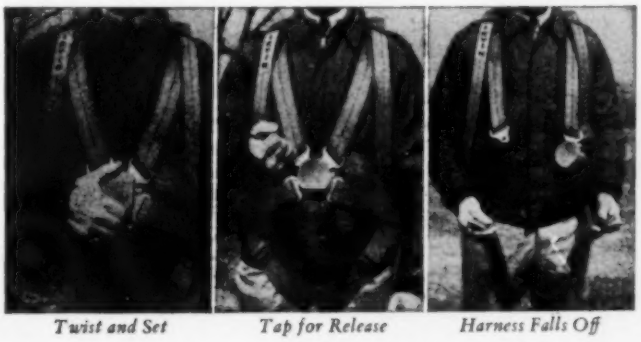

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BUY MORE WAR BONDS

Johnson Leaves CAP Command for Overseas Duty; Blee in Charge

Colonel Earle L. Johnson, national commander of the Civil Air Patrol, has departed for overseas Army Air Forces duty, leaving Colonel Harry H. Blee in the post of acting commanding officer.

The nature of Col. Johnson's overseas duty was not immediately disclosed, but it was believed he will direct important activities at numerous AAF installations in connection with redeployment of forces to the war against Japan.

Col. Blee, who is well known throughout the command, served on the AAF board of officers which planned the CAP program in 1941, and was the first AAF officer officially assigned to CAP headquarters. As training and operations officer, he developed the CAP training program and was responsible for the conduct of all active duty missions such as antisubmarine patrol, border patrol, courier service and tow target service. In his career as an engineer engaged in the design and construction of airports, he served as director of aeronautic development for the U. S. Department of Commerce.

Col. Johnson has been one of the pioneers in Civil Air Patrol. He formed a state organization in his home state of Ohio in 1941 prior to establishment of CAP, and at the end of that year became assistant executive officer as a civilian volunteer in CAP national headquarters, later becoming national commander, succeeding Maj. Gen. John F. Curry, after being commissioned an Air Corps officer.

Flight Proficiency Heads CAP-AAF Projects for New Activity Program

Many new CAP directives and regulations, the result of months of work by CAP and AAF officers, have been going out to the CAP organization to start new projects in motion across the country.

The long-awaited CAP flight proficiency program has now started. It calls for fifty hours of intensive ground training, with emphasis on flying safety, and concurrent flight practice missions progressing from simple problems in navigation up to the simulation of complex search missions and other practical flying which requires the highest degree of skill.

This program, observers point out, is opportune in view of the new Civil Air Regulations which place more responsibility than ever before upon the pilots. While new pilots still must demonstrate their ability to fly safely, they no longer have to pass examinations in navigation and meteorology. Voluntary study and discipline in CAP will make it possible for members to get real utility out of their planes rather than merely to fly for sport around the airports, and will help build public confidence in the airplane as a means of transportation.

All this practice flying will be done in private planes, not at government expense. Much of it will be in planes rented from commercial operators.

To give orientation flights to CAP Cadets, but not for flight training or practice, the Army has issued 300 PT-17s to CAP, replacing the L-type aircraft previously assigned. A series of eight new CAP regulations have been issued to govern the safe flying, operation, and maintenance of these planes.

New regulations are out also for the special CAP portable radio stations under the War Emergency Radio Service. It is estimated that more than 2,000 of these stations already are being operated by the forty-eight State Wings of CAP. Thousands of members have secured radio operator licenses after CAP training. The Wings have been authorized to deal directly with the Federal Communications Commission in the further expansion of their radio work.

COL. HARRY H. BLEE, well-known AAF officer in charge of CAP training and operations, has been named acting national commander of CAP during the absence of Col. Earle L. Johnson, now overseas.

CAP Aircraft Rentals Total $44,016 for First California Group

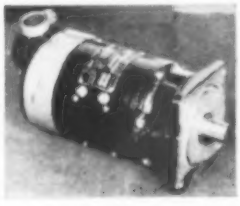
Evidence of what the CAP program means to commercial operators on airports open to civilian flying is given in the following figures compiled by the safety board of the First California Group, in Los Angeles.

Out of 6,799 airplane-hours of flying by pilots of this Group during the twelve months ended May 24, 1945, 92.5 per cent or 6,288 hours were flown in aircraft rented from fixed-base operators. "At a conservative $7 per hour, which is less than the going rate published by these operators," the board's report points out, "this amounts to $44,016 spent by officers and personnel of the First Group alone."

Flying of volunteer missions as well as practice accounted for no small part of the total.

CAP Dinners Mark Air Forces Day

CAP units sponsored over 800 local dinners on August 1 commemorating observance of Air Forces Day throughout the nation. General H. H. Arnold, AAF commanding general, had requested full CAP co-operation in the observance.



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By TONY HAGMANN

Los Angeles . . . Glendale and Burbank are as close as both parts of a midriff bathing suit on a pretty girl, size ten. But not as revealing concerning their postwar aviation plans, probably due to the sign on the desk of a Mr. Mason who has an office on Grand Central Airport. We sat in Mr. Mason's office for a full ten minutes and read the sign. It says: "To hell with reconversion, let's win the war." What we were doing there is silly. We were on our way to see Paul Manz, next office down, and got in the wrong door due to our Texas accent. Seems Manz sounds like Mason to some people, or maybe it was the popcicle. Texas accent, fooey, it was a chocolate popcicle, we tried. Never again; Mr. Mason's chairs are hard. And the popcicle was the melty kind, on a white blouse.

Paul Manz is known for his honeymoon express. He keeps a fast fleet of planes ready for any couple in love (and with the price) who have marriage on their mind. They call him day or night, Sundays, holidays, mostly sober, or just a little bit drunk on the potent juice put out by Cupid, in case you believe that story, and fly away to Las Vegas to get all married up. Very romantic, huh? He has been flying for twenty-one years, started out at March Field and recently flew one of the same type planes as he trained on for a movie shot. He is one of the fellows you see in the movies who flies when there is a shot to be made which is impossible—for the star. He wears the coveted Veteran Pilot Association pin and is dapper enough to be in the movies himself. Will do any kind of charter work and has flown all the big shots in the movies, like Will Rogers, Douglas Fairbanks, Peter Lorre and his new bride. He was technical adviser to Amelia Earhart and WASP Pilot J. Cochran. Watch your favorite magazine for more on this guy, with pictures.

You know Douglas Aircraft? Well, they made a plane called the UC-67 or the B-23. This airplane will cruise "an honest 250 miles per hour" and Paul Manz bought one. Then he found out who bought some others. Howard Hughes bought three; Pan American bought seven, for the executives to use on official business; Gar Wood, the famous speedboat man, bought two; Roscoe Turner, one, and a newspaperman named Hearst, one. Edgar Bergen of the Charlie McCarthy fame, bought a PT-19; Robert Cummings bought a Cessna he used during the Seventh Loan Drive. Other Cessna UC-78's were the Tovrea Packing Co., Phoenix; Cottle Mfg. Co., and the Hallet Manufacturing Co. of Inglewood. Tex Rankin bought a BT-13, W. W. Valentine (president of the Fullerton Oil Co.) and Arthur C. Stewart (v. p. of the Union Oil Co.) paid out the RFC fee and now have a BT-13 in their back airport. By the way, that B-23 looks like a DC-3 only a shade different some place. Guess aviation is being adopted like the orphan with red hair who won the Irish sweepstakes, everybody's doin' it.

Grand Central Airport is owned and operated by Major C. C. Moseley, who has trained a mile-high stack of cadets for the Army, among them Don Gentile, who distinguished himself as neatly as a butcher says No! Moseley is a pioneer in the aviation business, started out in 1917 according to a picture of him in flying togs a la World War I. When you come to the coast you must see the picture gallery at Grand Central. One five by seven has two names making news, Capt. E. Rickenbacker with Major Moseley, 1917, mind you. Another has Majors Carl Spaatz, Ralph Royce, Hugh Knerr and Davenport Johnson at Crissey Field, San Francisco, 1917. There are hundreds of others who are well known outside the industry since the world turned a flip and landed on its Fujiyama.

A little note on the airport. It is the largest privately-owned field in these parts, rents this and that out to one person or another, charter services, etc. They are distributors for Ercoupe and, we heard from the first guard of the second gate near the popcicle stand, they intend to build a set of showrooms. This we confirmed with the man who knows, Frank B. Howe. Frank used to be the man at the airshow who walked the wings "before I learned any better". He told us they would build an aircraft sales row, just like the automobile row, and people could look, fly and try all thirty-three before buying. This is under the heading of neatest trick of the year. Think of the traffic. Right now this field is busy with the Army, H. O. Fry, director of Industrial Relations, told us

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while we got okayed for walking around, but soon will be ready to seek your landing business. Then watch 'em, they're going to do things.

As you know, California has the biggest everything and now a Texas boy, Howard Hughes, has built 'em the biggest thing in planes. The Hughes Hercules is getting ready to fly, but first they have to remove most telephone and telegraph wires to be able to move the plane from the factory to the water for launching. It will be the biggest overland moving job ever attempted. If we hadn't seen it we'd say Californians were also the biggest liars in the world too, but there it is. Glad we thought of it instead of the Japs, but what will it do at thirty thousand feet?

The weather report. Sun unstuck, 9:30 to 16:30, Beaches crowded, water 70 degrees; heat wave . . . temperature 86. Transportation foul; hotels full; 222 restaurants closed —no food points; but a fine place to spend a summer if you like pup tents . . . and sand fleas.

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Dallas, Texas—*by Sandal Dailey.* Airline passengers headed west appear to be getting better acquainted with Love Field than they like. The crowded terminal is the scene for the arrival of about 300 disappointed passengers a month who get to Dallas by airline, but can't get any further.

Tom Collins, whose Airbank of America offices are on the second floor of the terminal, and his secretary, Shirley Baker, can tell plenty of stories about the women and babies, harassed businessmen and unhappy servicemen who have waited not-so-patiently for seats, sometimes as much as a week.

Through Collins' office, contacts are being made for a booming charter business, both by automobile and by plane. While the majority of the bumped passengers continue their trips west by automobile, at least a hundred a month are chartering planes, Collins estimates.

Spartan Executives, Wacos, Beechcrafts and Fairchilds are making daylight flights several times a week to El Paso, Phoenix and Los Angeles. J. V. Lincoln and V. Dabney of Love Field, Lou Foote of Lou Foote Airports, and Reed Pigman of Fort Worth are among the busiest of the charter operators. Prices run on the average of about $50 per passenger more than the airlines charge for the Los Angeles trip.

Love Field's Southwest Airmotive has in its shops a surplus Lockheed Lodestar being put in shape for operation for the Reynolds Metals Company of Louisville, Ky. It will be used by company executives.

Lt. Col. D. Harold Byrd, Texas CAP wing commander, has recently acquired a Lockheed Lodestar also.

The Dallas Junior Chamber of Commerce is planning to enter aviation activities again, Charles L. Dexter, Jr., aviation director for the chamber, reports. A committee to survey the needs of the Dallas area and to draw up aviation projects will get busy right away.

There is a possibility that the Dallas group will take under consideration an air marking project, recommended as a statewide need last year to junior chambers by Ayres Compton. Another project that may be brought up by the committee is the awarding of flight scholarships to high school aeronautics students.

The Dallas Jaycees had an active flying club before the war and may enter that field again.

B. Jay Anthis, president of the Dallas chapter, Texas Private Fliers, headed a delegation of Dallasites to the state meeting at Abilene the last week-end in July.

Birmingham, Ala.—*by Edith Wideman.* Summer school classes of the city high schools took advantage of the tours of the airport offered by Southern Airways. This is the first time the Summer classes have participated, but they decided it was as essential in their general science work as it is to the aviation classes.

The Quiz of Two Cities—between Delta in Atlanta over WGST and Delta in Birmingham over WAPI—wound up in a tie score which was a perfect solution in that Atlanta's quiz master, Frank Gaither, and Birmingham's same, Jimmie Willson, switched studios for the program. Southern Airways rolled out the Cessna when Ed Bishop of Delta beckoned —Jimmie was bumped.

Eastern's express run from NY to Houston gives us folks in Birmingham another quick run to New York as well as to Texas. Aero Club Member George Mattison said it was put on especially for him—the schedule is perfect for his two days a month business in Houston. Speaking of Eastern, the girls were caught oooing, aaaahing, swooning and autograph seeking the other day when Dennis Morgan boarded Eastern's plane to Chicago.

Bob Averill of PCA, Johnnie Sutton of Delta, Les Arnold of Eastern, along with city officials, made an imposing looking group going over airport leases and such in spite of the hot and sweltering day it was.

Hails and farewells were heard through Southern Airways hangar when C. P. Ims was transferred from Decatur to manage Southern Airways operation here. He replaces Watson Eaddy who has been transferred to Southern Airways in Charlotte to open full-scale operation there.

The Aero Club of Alexander City gathered quite a crowd of private fliers from over the state at their annual barbecue—Auburn, Birmingham, Montgomery, Gadsden, Anniston, and most every other flying burg hereabouts was well represented. We all wanted to bring home "some goat" in our helmets being as it had been so long since we'd seen anything but a meat substitute, but then we managed —by the hardest—to keep to our company manners and came home empty helmeted. "'Twas a *real* get-together".

D. K. Hudson, CAA Inspector, is playing hard to get these days we were told, but we found him on the second floor of the administration building in the middle of moving from downstairs.

The tour of inspection of the Birmingham Modification Center given to members of the Aero Club was enthusiastically attended—the roving over, under, in and below an honest-to-goodness B-29 was the main attraction.

Vance Tomlin of PCA has been promoted to regional traffic manager. C. J. Miller has been named divisional traffic manager for this division of PCA. PCA now has three round trips daily into New York from Birmingham.

If you don't think traveling is tough these days just ask Blanche Bentley at the airport who spent her vacation in the Windy City. Her advice is to believe what is told and stay at home. Is she kidding? What does she think *we're* doing?

Kansas City, Mo.—*by Marion Melcher.* Who can forget Eisenhower was here, the genial General for whom signs popped up all

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over the city saying "Welcome, Ike"? Instead of mingling with the jammed thousands, however, I sunbathed atop the St. Regis roof where I had a broad view of the aerial display of gliders that whispered by . . . bombers . . . fighters . . . wee planes and some transports on routine flights . . . and the ten Super-fortresses purchased by Kansas Citians in the General's honor.

Remember Commodore Dixie Kiefer, hero of the motion picture "The Fighting Lady"? He's just received a sound projector and the film, gifts of the chamber of commerce and 20th Century-Fox Film Corporation. The city fathers had a reception and dinner for him at the Muehlebach.

Morris & Jannsen Flying Service on the airport has been designated as the distributing center for surplus military aircraft by the RFC. Currently they have about thirty planes "on display," mostly primary trainers and some cargo cabin-type planes. Later they expect some 450-hp. basic trainers. The local plane mart saves prospective buyers of military planes from traveling to Wichita for a look-see.

This is becoming quite a town! Now we have a sign up in front of the YMCA which advises the passerby that the President learned to swim here, and wonders why YOU don't! Yes, President Truman flew in to the city and motored over to the Summer White House in Independence. He's still "Harry" to the home folks, and when he worked at the Federal building on Eighth and Grand during the short stay I was grateful for the help of traffic cops in maneuvering my aviation-blue Manana through the crowds!

Missouri's neighbor state, Kansas, is going in for a state-wide aviation education program this fall for elementary and high schools as well as colleges.

Whoooee! This United Nations conference

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in San Francisco winged many a visting bigwig to the "Heart of America." Most colorful perhaps were the twenty-two Arabians, robed and turbaned, some of the bodyguards carrying scimitars, daggers and pistols. Nope, no one dared say: "Lay that pistol down!" One day a Chinese five-star admiral stopped off at Olathe, and another time a British army plane brought Prime Minister Jan Christian Smuts of South Africa.

After being without an aviation commissioner for some months and Kenney Ellis carrying the load as assistant on her slim shoulders, the chamber of commerce selected G. R. Challinor as commissioner effective July 15. He was formerly with Aluminum Company of America.

It was a steak fry for the Women's National Aeronautical association in Kansas City. And there was plenty for seconds, too! Lt. Esther Wirthman, adjutant of CAP group 732, tossed the salad, while Ruth Ann Smith, program chairman, and Helen Stewart, president of the unit, handled the skillets. Mary Rice Scott was there from Texas. She's been catching up on flying in our welcome summer-resort atmosphere. Francie Meisner, former Wasp, is back from the Carolinas and may be bound for an instructorship at Marshall, Missouri. Connie Caraway told us the CAP converted an alfalfa field on the Stirtz farm into an airport between Abilene and Enterprise, Kansas. The runway is lined off by flags, and there's a small wooden tower where a boy waves the pilots in. And Emily Watson, associate editor of *The Wasp Nest*, reports that the awarding of the "E" for Pratt & Whitney was a fete she'll not soon forget. A special P&W plane arrived at the terminal from East Hartford carrying virtually the entire board of directors of United Aircraft as passengers.

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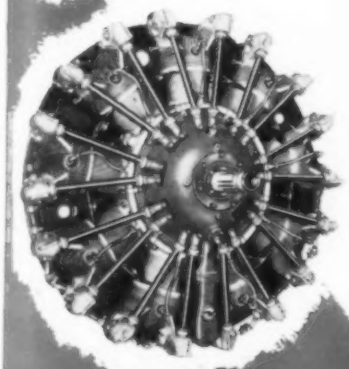

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